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Railway Age

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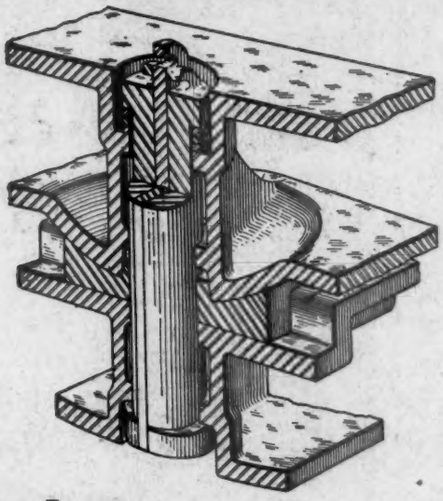

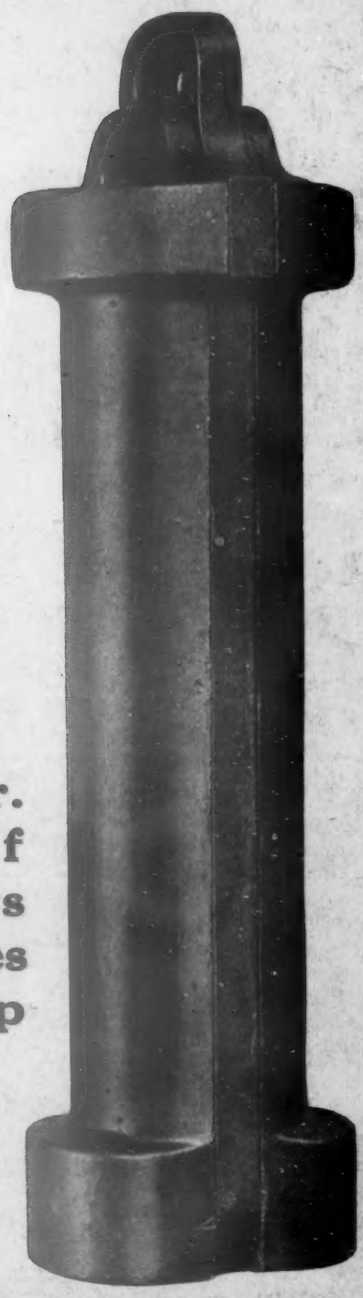

Safety Locking Center Pin

This device is a life saver. It prevents telescoping of passenger cars, maintains center of gravity and enables air brakes to quickly stop derailed trains.

W. H. MINER

CHICAGO

Various Views of the

"ACCO"
ONE-PIECE
GUARD RAIL

"ACCO" ONE-PIECE GUARD RAIL is made of special analysis open-hearth steel, cast to shape and thoroughly annealed.

The design eliminates rails, bolts, guard rail clamps and braces, and incorporates tie plates and foot guards.

It simplifies and reduces the cost of maintenance and provides a protection of the greatest strength.

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Railway Age

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WE GUARANTEE that of this issue, 12,500 copies were printed; that of these 12,500 copies 10,300 were mailed to regular paid subscribers to the Railway Age and Railway Mechanical Engineer; 110 were mailed to advertisers; 490 were provided for counter and news companies sales, new subscriptions, bound volumes, samples, copies lost in the mail and office use; and 1,600 copies for distribution at Atlantic City.

THE RAILWAY AGE is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

Probably few men who are familiar with the evolution of the Rules of Interchange read the report of the Arbitration Committee without a feeling of surprise that the committee has again proposed a combination of defects constituting unfair usage. The general trend of the rules has been to place more and more responsibility on the car owner. This naturally has the effect of enforcing a higher standard of construction and maintenance, which is admitted to be desirable. To include in the Interchange Rules any provision making the delivering line responsible for such items as the breakage of wooden sills or bending of steel center sills without cover plates, regardless of physical condition, would be an invitation to perpetuate weak construction and poor maintenance, particularly for non-operating companies or those handling light trains. There is more involved in this ruling than the mere question of responsibility for damage. It involves in addition the policy that is to be followed in the perpetuation of old cars, the design of new equipment and even the size of locomotives. The decision of the committee is in line with the progress of railroad operation and the members are to be commended for the change in their recommendations.

Continuing a Progressive Policy

The discussion of labor questions seems to be tabooed by the Mechanical Division. The American Railway Engineering Association, on the other hand, has a strong and live committee which reports each year on the economics of railway labor. Is it not a serious mistake for the Mechanical Association to ignore these questions? What would it not mean to the mechanical departments if their officers and foreman were thoroughly educated as to the simple economics of the labor problem? Could they not deal to far better advantage with the employees under them, and could they not work far more effectively to build up that *esprit de corps* which is necessary in any organization if it is to make good in a large way? It is fortunate that some railroads realize the force of this argument and that the officers and foremen enjoy the full confidence and support of the men in the ranks. Railroad mechanical officers at large, however, could do much better in this respect if they would discuss questions of this sort at their annual meetings and compare notes. It is vitally necessary for American railroad officers and particularly the foremen, thoroughly to understand the problems of dealing with and supervising men. Why not discuss these matters at the Atlantic City meetings?

Why Not Discuss Labor Questions?

There was a time when a person desiring to obtain the latest information on railroad mechanical subjects instinctively turned to the proceedings of the Master Car Builders' or the Master Mechanics' Association and it was more than probable that he would there find the data desired. Can this be truly said of current reports of the Mechanical Division? For example, suppose information is desired in regard to the present development and extent of application of automatic train connectors. If one turns to the report of the committee on Train Brake and Signal Equipment he finds in a few lines devoted to the subject that "one maker * * * * reports having 15 locomotives, 12 passenger trains, 100 ore cars and 34 slag cars equipped" and "another maker claims to have five passenger trains in Canada and one in the United States equipped". One would infer that this was the full extent of the development at the present time. Even a casual investigation, however, would have disclosed the fact that there were more than two manufacturers and a larger number of connectors in service. The report is perfunctory and barely sufficient to be called a report. There is no intimation as to the character of the couplers, their defects or success. Had the subject been of no importance to the railroads the committee could not have shown any less interest. If it was thought that the whole proposition was valueless, why did not the committee come out and say so? This would have at least been action and would have brought the matter up for discussion on the convention floor.

Automatic Train Connectors

Notable improvements have been made in the average standard of railroad refrigerator cars during recent years. Many roads now have cars which are up to the standard of refrigerating efficiency that is necessary for carrying meat and similar products. Three desirable features are becoming practically standard in refrigerator car construction, basket bunkers, insulated bulkheads and floor racks. Insulation in the walls of the car is receiving careful attention and

Developments in the Refrigerator Cars

most of the recent designs provide low conductivity, although in some cases there seems to be room for further improvement. The importance of providing rigidity in the body and avoiding air circulation is generally recognized. When the body, because of weaving, is no longer tight and the insulation begins to sag down, the car will not maintain a low temperature and will be extravagant in the use of ice. Realizing these conditions, some roads have been experimenting with steel refrigerator cars, and others with insulation which has sufficient structural strength to stay in place indefinitely and add somewhat to the stiffness of the cars. Another recent innovation is the location of the refrigerating medium along the roof of the car instead of at the ends, to provide more satisfactory circulation of the cold air over the lading. The experimental work now underway holds promises of further increases in the efficiency with which refrigerated products are handled.

Why Not the Steam Motor Car?

Most advocates of the gasoline engine driven motor car acknowledge that at the present time it is advisable to limit their use to such light weight cars as can be driven by gasoline engines which have already been developed for use on highway trucks. This distinctly limits the weight and carrying capacity of these cars and makes the problem at present one of finding the field where such cars will best fit and avoiding attempts to place them in service for which they are not well adapted. There is, however, a persistent demand for larger cars, which can not be ignored if this type of equipment is to be used as extensively as now appears probable. To develop thoroughly a large gasoline engine will take time, and while it may come in the next few years, the fact remains that nothing has yet been offered in which there is full confidence of assured success as regards economy and durability. In the discussion at a recent meeting of the New York Railroad Club, reference was made to a steam driven motor car of fair size which has given good service under severe conditions. As size limitations do not apply in the same manner to steam engines as to gasoline engines, it would seem as though there might be possibilities of development in this direction which should not be overlooked by builders and inventors. Moreover, equipment of this character would probably be well received by present railroad men who are accustomed to handle and maintain steam engines.

Electric Welding Opportunities

One of the most important uses of electric energy in railroad maintenance is that of electric welding. The process may be either spot, butt or arc welding—each has its uses and in the aggregate the possible applications reach an astounding total. The electrical engineer who has not investigated the possibilities of reclaiming worn and broken parts by arc welding has overlooked an opportunity for reducing maintenance costs which can scarcely be equalled in any other manner. Electric welding is not confined to iron and steel parts. It is conceded, of course, that ferrous metals form the great bulk of its applications in railroad work, but it does not follow that this is the limitation of the process. Brass, copper, bronze and aluminum have been successfully welded by the electric current. Welds made between two pieces of the same metal, or between different kinds of metal, have demonstrated beyond question the practicability of the process. Moreover, with possibly a few exceptions, these non-ferrous metals can be welded to iron or steel with wonderful results. Non-corrosive metals, such as copper, for example, are frequently of greatest importance when they can be coupled with iron or steel to secure the necessary strength, and in such instances the electric welding of the two metals may prove of inestimable worth. It must be remembered that in all of the applications mentioned, the results that have been secured were obtained at the expense of no small amount of experimentation and study, but they indicate clearly what can be accomplished when care and thought are given to the electric welding art. A great opportunity is offered the electrical engineer, for on the great majority of roads there is no one in a better position to study the possibilities of electric welding.

A Break in the Brake Beam Defenses

The brake beam is one of the most important parts of the equipment on a freight car, both from considerations of safety and maintenance economy. It is subjected to severe loads in service and failure to withstand these loads is likely to result in disaster. It is an expensive piece of equipment to replace and frequent renewals are undesirable. After long and patient effort on the part of the Master Car Builders' Association, standard specifications for new beams have been established to which the roads are now required to adhere in interchange service. No limitations are placed on the condition of repaired beams, however, and anything which will hold together, provided its original construction indicates that it once passed the proof load requirements of the specifications, may be restored to service. This goes far toward destroying the effectiveness of the specifications and leaves the handling line without protection against weak brake beams. The committee on brake shoe and brake beam equipment has done well to formulate reclamation methods to overcome this situation. There may be differences of opinion with respect to the need for the facilities recommended by the committee in its 1921 report, but this is unessential. Any practice that will best meet local conditions may be followed provided the repaired beams are subjected to proof load tests and are not restored to service unless they meet the requirements of the standard specifications. The essential requirement, then, is that a testing machine be provided and used. If this is done the advantage of concentrating the reclamation work at central shops which can be provided with suitable facilities will soon become evident. Eventually the rules of interchange should prohibit the application of repaired brake beams unless they are known to have passed the specification tests.

Advantages of a Unit Sill Section

The rolled center sill section recommended for adoption as standard for new cars by the Committee on Car Construction is worthy of most favorable consideration by the members of the Mechanical Division. It possesses at least two important advantages over a section built up of plates and angles, as is necessary in the case of the fish-belly type or of a channel and bottom angle flange in the case of sills of uniform section. Probably the most important advantage when comparing the proposed section with the fish-belly type is the greatly decreased opportunity for deterioration of the section through the development of corrosion. Every joint in built-up sills offers an opportunity

for the accumulation of moisture, heavily laden with acid in the case of coal carrying cars, with the result that the effective area of the section is rapidly reduced. Not only does this increase the cost of maintenance during the life of the car, but the maximum period of service which can be obtained before the car is scrapped may be affected by as much as 25 or 30 per cent. In extreme cases cars with this type of sill have completely failed after a service of not more than 15 years. In the case of sills of the channel and angle type the extent to which corrosion affects the life of the sills is, of course, much less. In this case the greatest advantage of the proposed unit center sill section is in the more effective distribution of the metal. With the same sectional area this increases the strength by 10 to 13 per cent. There is also a decrease in the cost of construction because of the elimination of the bottom flange rivets. Such a section, once in general use, will become a tonnage production proposition and will, therefore, probably cost no more per ton than structural sections now in common use.

Is Your Shop Properly Arranged?

Even though the shop buildings provided may be adequate, well-lighted and modern in their design and the machine tools well selected, the cost of operation will depend to a considerable extent upon the utilization of the space and the arrangement of the machines. Until an investigation is made, the needless expense frequently caused by unnecessary movements of material due to lack of consideration when planning the layout of machinery passes unnoticed. In manufacturing plants which were forced to know their operating costs in detail, there was long ago recognized the necessity of so planning the layout as to avoid every unnecessary move from the start to the finish of the manufacturing process. The ideal method is, of course, to receive the raw material at one end and so arrange that a job will pass through by the most direct route without backward movements, until it reaches the shipping department at the other end. While this is not always possible, the underlying principle is economically correct and has been followed as closely as possible by successful manufacturers. This same idea might well be more thoroughly kept in mind in connection with locomotive and car shops now that railroads are obliged to consider operating costs more carefully than they have had to in times past. Shops must be more economically operated. It is doubtful if a railroad shop exists anywhere in which it would not be possible to effect economies by rearrangements intelligently carried out after careful investigation. Time thus spent will produce results which will show good returns when the demand for output once more comes. The possibilities suggested apply not only to locomotive shops but to the blacksmith, boiler and car shops. It is to be regretted that no report is to be made this year by the committee on Car Repair Shop Layouts. There is some real work that this committee might do, and it is hoped that they will submit a report next year.

Stopping Power Plant Fuel Wastes

The logical thing to do after "spotting" power plant fuel wastes is to stop them and find some means of keeping them stopped. Fuel wastes can be stopped and maximum boiler efficiency obtained only by attention to many small details of apparently minor importance. These details include among others the careful lagging of boiler and steam pipes to prevent radiation loss; elimination of air leakage in furnace and boiler settings; checking up the loss due to incomplete combustion from whatever cause; preventing the short circuiting of gases in boilers; removing soot and scale; calibrating the dampers; finding the draft which will provide the highest CO_2 without CO and still carry the load; equalizing the draft between the boilers; finding the right kind of coal; and determining whether it should be fired wet or dry. It is one thing to stop fuel wastes and another to keep them stopped. The latter result can be accomplished only by some effective method of checking the work of firemen or stoker attendants and giving them an incentive to fire the boilers as efficiently as possible. Automatic devices for recording variations in draft and the proportion of CO_2 for each boiler are available, and when properly interpreted afford a practical measure of the boiler efficiency attained. Firemen and stoker operators should be impressed, as is not often done, with the fact that coal is only another form of money; if shown how much coal can be saved each day by following correct firing methods, most of the men will try to apply those methods. By playing the different firemen and different shifts against each other and posting records of the individual performances another incentive is afforded. Perhaps the best method of all is to install some sort of bonus system whereby the firemen or boiler room attendants receive extra pay in proportion to the efficiency with which they fire the boilers. Where a bonus system, based on the proportion of CO_2 maintained during the day, has been used and given a fair trial it has almost invariably been successful.

Increased Use of Grinding Machines

No small part of the development of the modern automobile may be credited to modern machine operations, particularly grinding. These machines are now made of sufficient capacity to finish locomotive and car parts from the rough stock. In the speed of production, accuracy and smoothness of finish, grinding machines are unsurpassed. They are particularly adapted also for the truing of worn parts. These worn parts are usually surface hardened due to a rubbing or wire-drawing action and if a cutting tool were used to true the surface a considerable cut would necessarily be taken to get under this hard shell. With the grinding machine, however, just enough material is taken off to true up the surface and, because little material is removed, there is a considerable saving on the time required for the operation. Railroad shopmen have been a trifle slow in realizing the adaptability of grinding machines to their work. Now, however, plain cylindrical gap grinders for piston rods, valve stems and similar work have been quite generally installed; also surface grinders for guides and other flat surfaces. There are still some shops which do not utilize grinders to the greatest advantage and either get along without them or else use old grinders which, through lack of power and rigidity, are entirely unsatisfactory compared to the modern machines which are available. There is a big field for the more general introduction of grinding machines of various kinds and sizes for railroad work. Internal grinders should not be forgotten and surface grinders equipped with magnetic chucks are adaptable to a wide variety of work now performed on other types of machines. An interesting article on "Getting Results from Modern Grinding Machines in Railroad Shops," is published in the June *Railway Mechanical Engineer*, page 317, and another article showing what is being done along this line in English railway shops appears in the same issue, page 325. The time is coming, if it is not now here, when no railroad shop will be considered equipped for maximum production without a full compliment of modern grinding machines.

Program for Today and Sunday

Saturday, June 17.

Entire Day Set Aside by Mechanical Division V to View the Exhibits.

ENTERTAINMENT

10:30 a. m.—Orchestral Concert, Entrance Hall, Million Dollar Pier.

3:30 p. m.—Orchestral Concert with Impromptu Dancing, Entrance Hall, Million Dollar Pier.

9:00 p. m.—Informal Dance, Carnival Night with Special Features by H. T. McConnell of Chicago, Ball Room, Million Dollar Pier.

Sunday, June 18.

3:30 p. m.—Sacred Concert, Music Rooms of Marlborough-Blenheim. The Albert Taylor Orchestra, New York City, and the following artists: Emily Stokes Hagar, operatic soprano, and the Criterion Male Quartette of Philadelphia; Charles Stahl, first tenor; William H. Carmint, second tenor; Harold Simonds, first bass; John Vanderslott, second bass.

Enrollment Today and Sunday

THE ENROLLMENT BOOTH will be open today—Saturday—from 9 a.m. to 12 noon; 2 to 4 p.m.; and 7 to 9 p.m.

On Sunday it will be open from 11 a.m. to 12 noon and from 7 to 8 p.m.

Will You Get Any of This?

NEWSPAPER DISPATCHES STATE that India recently has floated in London a loan of £75,000,000 and that most of the money is to be spent in the improvement and expansion of the railroads of that country. Some American manufacturers of equipment and supplies have found India a very good market in the past, and doubtless will get busy trying to get their share of the new business coming.

Lost and Found

BADGE No. 15 belonging to Willard Kells, superintendent of motive power of the Atlantic Coast Line, has been lost. Anyone finding it is requested to return it to the headquarters of the enrollment committee.

LOST! The following lost items have been brought to our attention by Secretary Conway of the Railway Supply Manufacturers' Association:

Camera—by Mr. Carrigan of the International Machinery & Supply Company.

Badges Nos. 3695, 5672, 3803 and 8328.

Pair of gloves.

Will the finders please return these lost articles to Secretary Conway?

Movies of the "Prosperity Special"

THE "PROSPERITY SPECIAL" of the Baldwin Locomotive Works has attracted widespread attention throughout the country. Some excellent moving pictures have been obtained of its progress westward. These the Baldwin Locomotive Works have arranged to show in the Rose Room of the Hotel Traymore at 8:30 p. m., Sunday, June 18.

The train consisted of 20 locomotives recently shipped to the Southern Pacific Lines. These pictures are remarkable in that they show not only the heaviest locomotive train ever moved, but also the scenic beauty of Pennsylvania between Philadelphia and Pittsburgh.

S. M. Vauclain, who was primarily responsible for the movement of this train and who clearly foresaw the stimulating effect which such a demonstration would have toward inspiring public confidence and aiding business improvement, will deliver an address.

Registration Figures

THE REGISTRATION FIGURES from four o'clock Thursday afternoon to four o'clock yesterday afternoon tell an interesting story and show an increase in the attendance of 758 people within this period of time. This increase was made up as follows: Railway men, 76; purchases and stores 10; special guests 96; supply men 544; railroad ladies 84; supply ladies 48.

The following figures show the registrations for 1922 and 1920. They show complete registrations up to four o'clock of the third day of the respective conventions:

	1922	1920
Members, Mechanical, A. R. A.	554	666
Purchases and Stores	26	37
Special guests	276	285
Supply men	2,215	1,935
Railroad ladies	421	413
Supply ladies	432	649
Totals	3,924	3,985

Cars on Track Exhibit

THE NUMBER OF cars shown this year on the Philadelphia & Reading track at the boardwalk and Mississippi avenue, just below the pier, is not as extensive as usual but will well repay one for a visit.

The only passenger car is one of the new steel coaches which the Philadelphia & Reading has received lately from the Harlan Plant of the Bethlehem Shipbuilding Corporation at Wilmington, Del. This car seats 78 people and weighs 117,600 lb., the length over-all being 72 ft. 5½ in., the length inside is 63 ft. 0 in. The trucks are of the four-wheel type, equipped with clasp brakes and spaced 49 ft. between centers.

Five freight cars are shown. The first one is a Virginian 120-ton coal car weighing 78,700 lb. light, built by the Pressed Steel Car Company. This car has Buckeye six-wheel trucks with clasp brakes operated by the "empty and load" brake. The car has one end jacked up and the truck run out for inspection after making 10,600 miles in regular service.

Two of the new Philadelphia & Reading hopper bottom coal cars are on inspection. Their light-weight is 53,900 lb. The coupled length is 42 ft. 11 in. and the length inside 39 ft. They are equipped with four-wheel trucks, having forged steel wheels and American Steel Foundry Company's steel side frames. One of the cars was built by the Cambria Steel Company and the other by the Middletown Car Works. Both are equipped with the empty and load brake, while a Minich super-safety hand brake is applied to one of them.

Another hopper bottom coal car shown is one belonging to the Westmoreland Coal Company, which has a capacity of 110,000 lb. and weighs 42,200 lb light. This car has trucks with Symington wrought steel side frame trucks.

The remaining car is a Michigan Central box car with Stafford roller bearing trucks.

A Visitor From Sweden

BROR VIKTOR PETERSSON, mechanical engineer on the Swedish State Railways, located at Norrkoping, Sweden, is visiting the convention as part of a carefully planned survey and study of American railway problems. He has been making a thorough tour throughout the country, having visited Washington, Altoona, Cleveland, Chicago, West Burlington and various points on the Great Northern and Chicago, Milwaukee & St. Paul since his arrival in this country on April 15.

Bror Viktor Petersson

Mr. Petersson is particularly interested in the use of pulverized fuel on locomotives and has expressed disappointment in not finding more locomotives equipped for burning this fuel in this country. In Sweden the question is being actively investigated, for something must be done to lower locomotive fuel costs. There are 10 locomotives there equipped for burning powdered fuel and all of them are giving excellent results. The greatest handicap in making this process a commercial success in Sweden has been the high cost of pulverizing the coal. From his investigations Mr. Petersson believes that we in this country have been using too high a grade of coal for our powdered fuel installations. He believes that a low gas coal of not too high thermal value will give better results than a high gas coal of high thermal value and reduce the liability of explosion. In Sweden they have had no difficulty with explosions whatever. They use a 50-50 mixture of Swedish coal, having about 9,000 B. t. u. and good English coal of about 14,000 B. t. u., and they seek to keep the volatile below 25 per cent.

In commenting on the use of Diesel locomotives or Diesel-operated cars in Sweden, Mr. Petersson says that this is restricted almost entirely to the privately owned lines in Sweden, of which there are a number, the Swedish government operating only about 50 per cent of the standard-gage mileage of the country. A large number of Diesel locomotives have been built in Sweden for railroads in southern Europe.

As is well known, Sweden has been very much interested in the use of roller bearings for car equipment and several experiments have been conducted. It has been found that friction is very materially reduced by their use and the only reason why this type of bearing has not been more extensively adopted is because of the initial first cost, for, as Mr. Petersson says: "We in Sweden are not rich like you people in America." These roller bearing tests have been extended to locomotives and tenders, the trucks of the locomotives and all tender wheels being equipped with the bearings. The tests have been fully as successful as those made on the car equipment.

Mr. Petersson is to remain in this country until about September 15 and after the convention is to continue his tour of inspection and investigation throughout the country. He will return to Chicago and proceed to the Pacific coast, thence back to New York through the south. He will visit the principal shops and railways in his travels, giving particular attention to the study of refrigerator car equipment.

He has been very much impressed and delighted with the reception he has received on the railways he has already visited and desires to take this opportunity of making his appreciation known to the railways.

Breaks in the Ranks

IN *The Daily* of June 15, page 1422, we recorded the deaths of 27 members of Division V, Mechanical, American Railway Association, who had passed away since the last convention in June, 1920.

The news of the death of Joseph Maycock at Buffalo on the opening day of this year's convention brings to mind the faces of a dozen other supply men well known as attendants at these gatherings, who have passed to the Great Beyond during that period. They are:

Albert C. Ashton, treasurer of the Ashton Valve Company, who died on January 31, 1922.

Robert A. Bole, vice-president and district manager of sales at Pittsburgh of Manning, Maxwell & Moore, Inc., who died April 2, 1921.

James C. Currie, eastern representative of the Nathan Manufacturing Company, who was killed in an elevator accident December 11, 1920.

Otis Cutler, chairman of the board of directors of the American Brake Shoe & Foundry Company and a director in a number of other concerns, who died March 4, 1922.

Charles A. Lindstrom, assistant to the president of the Pressed Steel Car Company, who died September 2, 1921.

James B. Rider, vice-president and general manager of the Pressed Steel Car Company, who died November 3, 1921.

Joseph S. Ralston, president of the Ralston Steel Car Company, who died September 11, 1920.

Clarence E. Rood, sales manager of the Gould Coupler Company, who died December 11, 1921.

Frank P. Smith, railway representative of Manning, Maxwell & Moore, Inc., who died November 3, 1921.

B. E. D. Stafford, general manager of the Flannery Bolt Company, who died November 30, 1921.

John G. Talmage, president of the Talmage Manufacturing Company, who died August 25, 1920.

Harry R. Warnock, appointed vice-president in charge of mechanical matters of the Standard Steel Car Company in July, 1920, and prior thereto general superintendent of motive power of the Chicago, Milwaukee & St. Paul, who died January 19, 1921.

Joseph Maycock, who died on Wednesday night, last, was the railroad representative of Pratt & Lambert, Inc., for some 25 years, and was a familiar figure at the M. M. and M. C. B conventions for a considerable part of that time.

Albert C. Ashton not only attended the conventions regularly, but was active in the affairs of the Railway Supply Manufacturers' Association. Also, it seldom if ever happened that Mr. Ashton came to the meetings without his mother—"Mother Ashton," as she was reverently called, not only by her family, but by her many friends. She, too, passed away a month ago in the same delightfully peaceful way in which she had lived.

James C. Currie was a man much like Mr. Ashton in many ways. He, too, had much to do with the activities of the railway supply men at these conventions; but his time of service was longer and the contact much more intimate. For several years he acted as treasurer of the organization.

While a considerable number of the present generation of followers of the conventions will not recall Frank P. Smith well, if at all, it is not so many years ago, in the days of the Hancock Inspirator Company and for some time after that concern was absorbed by Manning, Maxwell & Moore, Inc., when he was well known not only to many railway supply men, but also by a host of railway men.

Then there is B. E. D. Stafford—"Staff" as he was called with not a little touch of affection by a large number of men in the railway field. He was typical of the many splendid men who have brought the Railway Supply Manufacturers' Association to its present high plane; and it was those same simple, honest qualities which carried him to success in the company he served from its infancy. At the time of the last convention Mr. Stafford was confined to his home at Millville, just a few miles from Atlantic City, through a paraletic stroke, the last of a series of which finally caused his death last November.

No two of the other eight men were quite alike. Mr. Cutler was, of course, in a class by himself, judged purely from the heights he had attained in the world's affairs. Yet withal he was the fine, approachable fellow that made the lives of others so worth while; and he always concerned himself with the smallest details which made for cleanliness and progress in the ranks of the railway supply men. Of the remainder, it would be hard to draw close parallels. They differed in dispositions, sometimes widely, much as do men as a whole; but each had achieved something and each contributed in like manner to the progressive success which has culminated in what we see here at Atlantic City this year.

Canadian Night

IN HONOR of our Canadian members and the many Canadians who are attending the convention the Entertainment Committee put on a "Canadian Night" last night. The citizens of our neighboring country were there and they greatly enjoyed the attention given them and the evening's festivities, generally speaking. The ballroom on the pier was gaily decorated with the flags of their country and of ours. The dancing programs were also illuminated with the flags, in colors, of each country.

At 9:30 o'clock the dancing program, consisting of 16 numbers, commenced. In the intermissions refreshments were served and bits of vaudeville sketches given by artists from Montreal. They were here with the permission of Sergeant-Major R. J. Hiller, of the Fifth Royal Highlanders. They were Jack Hunter, Canada's Harry Lauder; James Robertson and Jean Thompson, juvenile dancers of considerable fame, and five members of the Royal Highlanders who were entitled "The Canadian Black Watch." Rhys Morgan, of New York, also sang. The night's entertainment was greatly enjoyed.

Those of the Entertainment Committee in charge of the evening were: W. J. Carrigan, chairman; Webb C. Krauser, assistant chairman; Oscar C. Hayward, A. R. Miller and W. A. McWhorter.

Mr. and Mrs. B. A. Clements are accompanied this year by their daughter and son. The son, Robert, has just finished a course at the Staunton Academy in Virginia.

Members of the Railroad Labor Board in attendance at the convention. Left to right: Judge R. M. Barton, Samuel Higgins, Walter L. McMenimen, G. W. W. Hanger and Horace Baker.

American Railway Association—Division V—Mechanical

The Committees Dealing With Construction and Important Details of Cars Reported Yesterday

Chairman Tollerton called the meeting to order at 10 a.m. and called for report of Committee on Car Construction.

Report of Committee on Car Construction

The work of this committee during the past 10 years has had a marked influence in bringing about a more general appreciation of the importance of correct fundamentals in the design of freight cars. This part of the committee's work, however, has been simple in comparison with the task of developing a set of standard car designs which will be generally acceptable to the members of the American Railway Association.

In 1915 the committee presented to the Master Car Builders' Association a design for an outside steel sheathed 40-ft., 6-in. box car. But the further development of this or other designs was not pushed, owing to the action of a subcommittee of the old American Railway Association, under the chairmanship of the late E. P. Ripley, in taking up the same task. The war then intervened.

The committee has again actively taken up this work and hopes to present one or more complete designs next year. It now has 15 members who represent practically all sections and railroad interests in North America (except Mexico), and its greatest task is likely to be political rather than technical in its character.

Arrangement of Refrigerator Cars to Prevent Salt Water Dripping on Rails

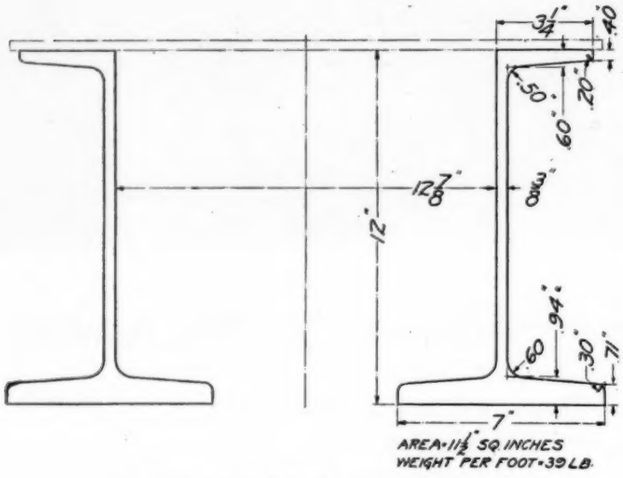
THE VARIOUS REFRIGERATOR transportation companies have either developed a brine retaining valve of their own or favor some particular type of valve. So many of their cars are equipped with brine retaining valves of the type they favor that it will be difficult for them to agree on any other type of valve, unless it is something which is a great improvement over the one they now use. Such a device has not been called to the attention of the committee. It would, therefore, appear advisable to adopt a set of rules covering the design of valves and brine tank equipment, as well as for the inspection of this part of the refrigerator car.

A canvass of brine valve application to refrigerator cars shows that the cars of twelve railroads and car lines are either all equipped or will be, in all but one case, during the current year.

The following rules are suggested for adoption as a standard of the Association:

RULES FOR BRINE VALVE AND OPERATING RIGGING

1. Operating rods shall be solid and not less than 5/8-in. in diameter.
2. Operating lever at top shall be of wrought or malleable iron, with cross-section area not less than 1.5 sq. in.
3. Rubber seats shall be made of pure rubber, to resist the action of salt water.
4. Cast parts shall be of malleable iron, not less than 1/4-in. thick.
5. All parts of brine valves shall be heavily galvanized or sherardized.
6. All surfaces adjacent to rubber or other seats in the valves shall be machined and free from fins, blow holes or other defects.
7. Valve operating mechanism shall be so constructed that valve must be closed before plug can be put in place.



Proposed Standard Center Sill Section

8. Where possible, valves should be so arranged that weight of brine in tank will hold the valve closed.
9. The diameter of wearing pins and connecting bolts shall be not less than 1/2 in.
10. All nuts shall be held in place by cotter pins at end or by lock nut.

RULES FOR CLEAN-OUT OR HAND-HOLE CASTINGS

1. Cast parts shall be of malleable iron, not less than 1/4-in. thick.
2. All parts of clean-out casting shall be heavily galvanized or sherardized.
3. Clean-out castings shall have a gasket between cover and clean-out frame.
4. The cover locking device should be simple in operation and easy to close.

RULES FOR BRINE TANK

1. The tank shall be made of heavily galvanized iron, not less than 1/16 in. thick.
2. All joints shall be riveted and soldered.
3. Connection castings shall be made of heavily galvanized or sherardized malleable iron castings.
4. The brine tank shall be securely supported and fastened in end of car.

RULES FOR INSPECTION

1. See that rods, levers and other parts of the brine valves are connected, and that valves function properly.
2. Inspect the following parts for leaks: Clean-out castings, tanks, valves, and connections between tanks. All leaks shall be repaired before a car is loaded.
3. A card, reporting the brine tank equipment in serviceable condition, signed by the foreman in charge of the inspection, shall be filed before a car is loaded.

Standard Fundamentals for Cars

The committee desires to present the center sill section shown, for adoption as standard for all cars except those which, on account of insufficient side sill strength, require fish-belly center sills, such as flat cars and gondola cars with very low sides. The section proposed presents the least surface for corrosion, with a maximum section modulus. Therefore, the loss in strength per year will be a minimum.

It is applicable to all cars, with few exceptions. It will reduce the number of rivets in center sills by an appreciable amount, and, therefore, will correspondingly reduce the cost of the car. Interchangeability of details will be very materially increased, reducing the amount of repair stock to be carried at the different shops.

We earnestly recommend that this section be adopted as the standard of the Association, for all cars which do not necessarily require fish-belly center sills, and that all railroads use this center sill section for all new construction.

Standardization of Marker Lamp Socket Brackets and Holders

The standard marker lamp socket and marker lamp bracket were brought to the attention of your committee, suggesting a standard marker bracket and socket to promote interchangeability. The committee proposes that a slight modification in the present standard socket be made by adding a bevel, and that a standard marker bracket foot be adopted, as shown in the illustration.

Care should be exercised to make the exterior of the bracket foot and the interior of the socket smooth and close to dimensions so that they will mesh properly.

Standard Box Car Body Designs

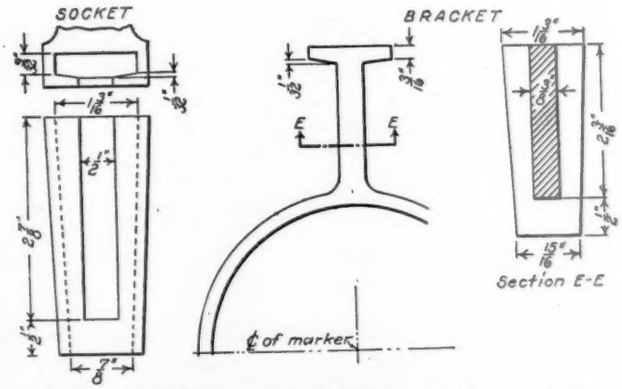
A number of meetings with the Committee on Car Design and Engineering, of the Car Manufacturers' Association of the United States, were held to go further into the question of fundamentals of car construction, which finally resulted in the submission of several preliminary designs by the Manufacturers' Committee, which are now under advisement by your committee, which hopes to submit one or more complete designs next year.

Equipment Classification to Facilitate Mileage Allowance on Private Cars

Under date of October 24, 1921, the Transportation Division issued a circular covering mileage rates, which led to requests for more definite and precise description of privately owned freight cars in the Equipment Register.

Representatives of the committee on car construction conferred with the subcommittee of the Committee on Records of the Transportation Division, who agreed that the value of mileage depends on whether or not the car is suitable for coal or coke. It was also agreed that a car which has sufficient strength and cubic capacity to carry its marked capacity of bituminous coal should be considered suitable for coal or coke. The Mechanical Division was, therefore, requested to provide two classifications instead of the present single classification "GB," with definition for each. The following is submitted for adoption:

"GB"—Gondola Car—A car open on top, with solid bottom, sides and ends, suitable for mill trade but not suitable for coal or coke.



Proposed Modified Standard Marker Socket and New Standard Bracket

"GK"—Gondola Car—A car open on top, with solid bottom, sides and ends, suitable for mill trade and for coal or coke.

The following modifications to definitions for "GB" and "GM" cars, to decrease ambiguity, are also recommended for adoption:

"GD"—Gondola Car—A car open on top, having side dump arrangement, and suitable for coal or coke.

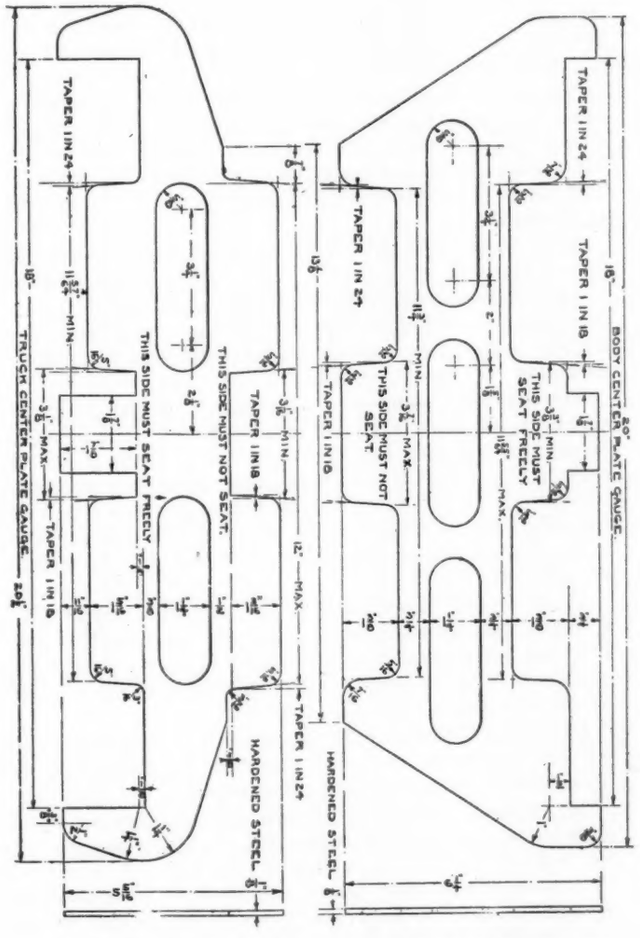
"GM"—Gondola Car—A car open on top, with solid bottom, low sides and drop ends, to facilitate twin shipments. suitable for mill trade, and not suitable for coal or coke.

On request for a classification, designation and description of the Virginian 109-ton gondola cars, the committee selected and submit the following for adoption:

"GT"—Gondola Car—A car open on top, with high sides, solid bottom, sides and ends, suitable for unloading coal on dumping machines, but not suitable for mill trade.

Gages for Center Plates

Communications from members indicated the desirability of adopting tolerance gages for standard center plates. It was stated that the absence of such gages permitted conditions where the body and truck center plates locked, causing derailments.. The


TAPER 1 IN 24
TAPER 1 IN 19
THIS SIDE MUST SEAT FREELY
THIS SIDE MUST NOT SEAT.
THIS SIDE MUST SEAT FREELY
HARDENED STEEL
TRUCK CENTER PLATE GAUGE.
BODY CENTER PLATE GAUGE.

Proposed Tolerance Gages for Standard Center Plates

gages shown in the drawing are submitted herewith for adoption as standard.

Standard Truck Designs

The Subcommittee on Car Trucks, in conference with the Cast Steel Manufacturers' Committee, has made considerable progress toward producing one or more designs of trucks. Preliminaries on which agreements have been reached are:

Assumed method of loading; maximum stresses to be allowed; design of spring plank attachment to side frames applicable to all of the three existing types of side frames; designs of cast steel and pressed steel bolsters to be interchangeable; side frames, with their boxes, to be interchangeable; complete trucks to be interchangeable, and the use of standard wheels, axles, bearings, wedges, brake beams, brake shoes, hangers and springs.

It is expected that truck designs can be completed in the coming year, these designs to incorporate fixed conditions, facilitating interchangeability between details, singly or in groups, and so that preferred specialties can be substituted for standard detail construction.

Arch Bars for 80,000-lb. Capacity Cars

Our attention was called to frequent breakage of bottom arch bars of these trucks, with request for investigation of the stresses involved. It was found that the stresses were considerably higher than in the corresponding members of other trucks. To correct this, it is recommended that the bottom arch bar be increased in thickness from 1⅜ in. to 1½ in., and that the column and journal box bolts be increased in length by ⅛ in.

End Stake Pockets for Flat Cars

An ever recurrent suggestion is to provide all flat cars with end stake pockets. Their absence often necessitates considerable extra expense for end bracing of shipments, and sometimes loss of loading length. We submit, for adoption as recommended practice, that flat cars be provided with end stake pockets substantially attached to underframe members.

The report was signed by W. F. Kiesel, Jr. (Chairman), Penn. System; A. R. Ayers, N. Y. C. & St. L., C. E. Fuller, Union Pacific System; J. C. Fritts, D. L. & W.; C. L. Meister, A. C. L.; J. McMullen, Erie; T. H. Goodnow, C. & N. W.; John Purcell, A. T. & S. F.; W. O. Moody, I. C.; J. A. Pilcher, N. & W.; H. L. Ingersoll, N. Y. C.; W. H. Wilson, N. P.; F. W. Mahl Southern Pacific Co.; W. H. Winterrowd, Canadian Pacific, and G. S. Goodwin, C. R. I. & P.

Discussion

After the tabulation showing brine value applications to refrigerator cars, Mr. Kiesel said: It will be noted that nearly all of the cars are equipped and the rest of them no doubt will be equipped this year. Therefore there is no necessity for further extending the time limit set by the Arbitration Committee.

With reference to the definition of gondola cars, early in the report, Mr. Kiesel said:

Since this report was written, our attention was called to the fact that if we simply put in the definition as we have given it here under "G B" and "G K," it will not include the description of a car suitable for coal and coke. Therefore, with your permission, after this meeting we will add to these descriptions a clause to complete it which will be about like this:

"G. B."—Gondola Car—A car open on top with solid bottom, sides and ends, suitable for mill trade, but not having either sufficient strength or cubic capacity to carry its marked capacity of bituminous coal.

That will make it clear, so there cannot be any misunderstanding.

[A similar change is to be made in the definitions of the "G D" and "G M" cars.]

I. S. Downing (Big Four): I think that the committee is right on this thickness of the arch bar. The trouble comes not only from breaking, but from sagging, and if we have 1⅜ in. as standard, we should have something in the rules to provide for 1⅜ in. on the other fellows' cars.

Prof. L. E. Endsley (University of Pittsburgh): With regard to the 1⅜ in. bottom arch bar to replace the 1¼ in. arch bar, I do not believe that much gain will be made for the point where the arch bars are breaking is at the bend, and at this point a large proportion of the stress is secondary, induced through the bending. Increasing the arch bar from 1¼ in to 1⅜ in. increases these secondary stresses 20 per cent, while the primary stresses are reduced only 10 per cent. Adding 20 per cent and taking off 10 per cent does not seem to improve it very much. I think more gain could be made by widening the arch bar instead of increasing its thickness. These statements are not made from calculations, either, but from actual tests.

Mr. Kiesel: From what Prof. Endsley said, it would seem that we are wrong in allowing a 50-ton arch bar truck, because we would have more stress. The arch bar is supposed to be supported in the bend and everybody is trying to do that. If we are wrong in increasing the arch bar for the 80-ton car, we are certainly wrong in having arch bars under the 100,000-lb car. I do not think that the reasoning is correct.

Prof. Endsley: I would like to submit to the Car Construction Committee a full record of something like 21 arch bars which I have tested.

Mr. Kiesel: We will be glad to have anything you can submit, establishing what you have stated and if the figures support your contention I think we will agree with you.

Mr. Downing: In these figures I presume that the figures which have been used for the last fifteen years in the cast steel truck side will be covered.

Chairman Tollerton: It is extremely important that we have a complete discussion before this report is submitted to letter ballot.

George W. Rink (C. R. R. of N. J.): The committee recommends a special stress for center sills. They also report a number of meetings with the Committee on Car Design and Engineering of the Car Manufacturers' Association of the United States, and they expect to have a design of standard box car body ready to report to the next session.

I would like to know whether or not they have passed on this question of the section of the center sill construction, or whether they will come out with another section.

Mr. Kiesel: As we understand it, whatever design the Mechanical Division adopts as standard, that design must be observed by every manufacturer who makes designs for the division. It will be expected that the members will follow it in the construction of new cars.

C. H. Bilty (C. M. & St. P.): Our road is in favor of going to a special shape of center sill construction, but of course we are a little hesitant to use something that we have never used before. We also feel that 24 sq. in. is ample for all of our requirements, which we are using both in repair work and on the new cars, and hence we feel that it would be more or less of a hardship to be compelled to accept the committee's recommendation in this respect.

Mr. Kiesel: As I understand it, Mr. Bilty's idea is that they now have cars with 24 sq. in. center sills, and assumes that the section recommended by the committee would have to be used in the case of all repairs. That cannot be done in all cases. You cannot substitute a 12-in. center sill for a 10-in. sill. But I believe that if the railroads once use it they will be glad to adopt it for repairs also as it will save money.

F. H. Hardin (N. Y. C.): I would like to ask if the dimensions, shown in Fig. 1, are included as part of the committee's recommendation?

Mr. Kiesel: They are.

Mr. Hardin: May I ask what thickness of the cover plate is recommended?

Mr. Kiesel: That question has not yet been settled by the committee. Tentatively it has been agreed that for box cars in which the superstructure assists the center sills more than on flat cars, we will use ¼-in. cover, and on all other cars, ⅜-in. covers; 28 sq. in. on box cars and 30 sq. in. for all other cars.

G. S. Goodwin (C. R. I & P.): With the proposed section of center sill, it will be necessary to cut off the inside lower flange where the draft rigging is applied. I would also like to inquire if it is proposed to recommend or apply any reinforcement behind the draft rigging to get greater area from the front stop back to the bolster.

There is also a question as to the stake pockets on flat cars. It seems to me that it would be desirable, if possible, to say whether those pockets should be inside or outside of the sill.

Mr. Kiesel: We did not intend to be specific in regard to this, but to make a general rule which would cover strength conditions. As long as we do not have a standard fiat car design, we cannot give a specific design and say it has got to be used.

Mr. Giles: The arch bar question would be solved to some extent by the committee embodying in their report a recommendation to the railroads that the use of arch bar trucks under new equipment should be discontinued. The use of arch bar trucks should be confined to existing equipment.

Mr. Tatum: Would it be wise to consider the elimination of the arch bar truck? There have been vast changes in the development of the arch bar truck and I think it would be a drastic action at this time to consider its elimination unless you stipulate the design that you care to eliminate.

Mr. Kiesel: Some of the members of the committee are very much in favor of eliminating arch bar trucks from new designs, but others are not. Even if we did make a suggestion it would not pass. I believe that question should be left until the committee has developed and furnished truck designs to be adopted as a standard and those truck designs should be such that all the stresses are properly cared for.

R. D. Bryan (Santa Fe): The proposed center sill is a special section and after you cut out for the draft gear, I do not see where you have anything better than a pair of commercial channels. These special sections are hard to get sometimes.

Chairman Tollerton: If the report of this committee is adopted, manufacturers will make the section which will be a regular section for car construction.

Mr. Kiesel: The sill section must be balanced, and in addition to the channel center sill, an angle is united to the bottom and a cover plate at the top. A section of that nature will have a section modulus corresponding with a section area of 115 or perhaps 120, while the section modulus of this is over 130, and thus for the same area you get greater strength.

Of course, we cut out for the draft gear; we do not run the angles into the draft gear now, but our backstop is behind the draft gear, and the column action is from rear follower plate to rear follower plate. This section, therefore, as a column carrying member is stronger than the same area we have used heretofore.

(*A motion that the report be accepted and the vote taken by letter ballot was carried.*)

Report on Couplers and Draft Gear

The long task of this committee in developing the Type "D" coupler has now been brought to a conclusion and in the future matters pertaining to couplers will require but little of its time.

This year's report marks the interim between the completion of one task and the active prosecution of another equally as extensive. For its future work the committee is now taking up the testing of draft gears that have been subjected to a period of actual service, to supplement the Rochester tests of the United States Railroad Administration on new gears. A speceial drop testing machine is being developed for this work, the purpose of which is to furnish information of the same character as that obtained in the Rochester car impact tests, but with closer control of variable conditions other than those in the gears themselves.

DURING THE PAST year the activities of the committee with respect to draft gear investigation have been limited on account of the depression in business through which the railroads have been passing. It is the purpose to pursue the draft gear work diligently during the coming year.

Following are a number of recommendations concerning the Standard "D" Coupler Specifications and gages, which are submitted for your approval at this time.

Standard "D" Coupler Specifications

It is proposed to revise paragraph 15-B to require 10 per cent of the complete couplers to be weighed, rather than all the couplers. The revised paragraph follows:

> "15-B. When couplers are purchased complete and assembled, 10 per cent of the couplers in each lot of 100 or less shall be individually weighed and shall come within the limits as shown on Fig. 6. Upon the failure of a coupler to come within the limits as shown on Fig. 6, the weighing shall be extended to the entire lot. Failure of any coupler to come within the limits shall be sufficient cause to reject the coupler unless the weight can be adjusted by the manufacturer. Detail parts shall come within the limits as shown on Fig. 6, one coupler being dismantled in each 100 and weighed."

Actual experience in carrying out the "D" coupler specifications developed that weighing 10 per cent of the complete couplers furnished sufficient check on the product.

Gages for Standard "D" Coupler

The following gages for the Standard "D" Coupler are recommended for your approval: 16529-1—Bottom Lock Lift Lever Gage; 16529-2—Bottom Lock Lift Toggle Gage, and 16529-3—Bottom Lock Lift Lever Gage Pin. These gages have been developed by the manufacturers since adoption of the Standard "D" Coupler Specifications in 1918, and take care of the bottom operating mechanism for the coupler.

Table of Weights for the Standard "D" Coupler

The table of weights shown is recommended for approval to replace the table of weights now appearing in the "D" coupler specifications. The weight table has been revised to conform with the weights obtained on a large number of couplers and a column has been added giving the normal weights.

The report is signed by R. L. Kleine (chairman), Penna. System; J. C. Fritts, D. L. & W.; J. R. Onderdonk, B. & O.; J. A. Pilcher, N. & W.; C. B. Young, C. B. & Q.; L. K. Sillcox, C. M. & St. P.; Samuel Lynn, P. & L. E.; L. P. Michael, C. & N. W., and Prof. L. E. Endsley, University of Pittsburgh.

Discussion

Mr. Bilty: The report states that "Failure of any coupler to come within the limits shall be sufficient cause to reject the coupler unless the weight can be adjusted by the manufacturer." Just how would the manufacturer adjust the weight?

Mr. Kleine: If you could get all parts of minimum weight in a complete coupler, it might fall below the minimum requirements. You could then put in a heavier knuckle, bringing the total weight of the coupler within the minimum specification weight.

Mr. Bilty: Then if the bar is perhaps a little under weight, or the locking block and the knuckle a little light, will the coupler be accepted?

Mr. Kleine: The coupler will be accepted.

Mr. Rink: I would like to ask Mr. Kleine whether he

LIMITING WEIGHTS—"D" COUPLER

Coupler Shank	Weight	Top Operation Without Fittings	Top Operation Comp. with 9 in. Knuckle	Top Operation Comp. with 11 in. Knuckle	Bottom Operation Without Fittings	Bottom Operation Comp. with 9 in. Knuckle	Bottom Operation Comp. with 11 in. Knuckle
6 in. by 8 in. shank, 6 in. butt	Min.	266	385	389	267	389	393
	Nor.	274	397	401	275	401	405
	Max.	286	415	419	287	419	423
5 in. by 7 in. shank, 6½ in. butt	Min.	259	378	382	260	382	386
	Nor.	267	390	394	268	394	398
	Max.	279	408	412	280	412	416
5 in. by 7 in. shank, 9⅛ in. butt	Min.	267	386	390	268	390	394
	Nor.	275	398	402	276	402	406
	Max.	287	416	420	288	420	424

WEIGHT OF FITTINGS

Fittings	Minimum	Top Operation Normal	Top Operation Maximum	Bottom Operation Minimum	Bottom Operation Normal	Bottom Operation Maximum
9 in. cored knuckle	90	93	97	90	93	97
11 in. cored knuckle	94	97	101	94	97	101
Lock	13.5	14.5	15.5	13.5	14.5	15.5
Total weight of parts (with 9-in. knuckle)	119	119	123	122	126	132
Total weight of parts (with 11-in. knuckle)	123	127	133	126	130	136

has received any complaints of the Type "D" coupler lock lifter dropping down behind the lock and wedging in such a manner that it is impossible to throw the coupler? We have had several cases of that kind with couplers applied to Railroad Administration coal cars. It may be due to a faulty core, but I am wondering how extensive that trouble is on other roads.

C. G. Juneau (C. M. & St. P.): As far as our line is concerned, we have not had any trouble with the Type "D" coupler.

J. A. Pilcher (N. & W.): On the Norfolk & Western we have some very large cars using these couplers and I mention this because there has been some tendency to go back to the lighter coupler. In examining a group of these cars, where it is necessary to remove the couplers right along, one of the car men asked me a day or two ago: "What shall we do with these couplers?" Out of sixteen examined, three had upset 1 in., two of them ⅞ in., three ¾ in. and four ½ in. The rest of them had upset from ¼ in. to ½ in. The question is, what are we going to do next if we keep on hammering the cars? We must put some limit on the speed with which contact is made in switching.

Mr. Kleine: The Coupler Committee is glad to receive any information whatever in regard to defects which may develop in the Type "D" coupler. When it was designed we did not believe it was perfect, but we did take great care to get the coupler as near 100 per cent as possible. Mr. Goodnow called our attention to another case of the lift lever dropping back of the locking block and I think we had two cases of this kind on the Pennsylvania System. We ran those cases down, but could not find how the lifter could get back of the locking block. We cut sections out of the coupler and it was not possible to place the lifter so that it would drop down back of the locking block. We are convinced that somebody had taken the coupler apart and had not placed the lifter back in the slot. If anybody else has experienced any similar trouble, the committee would be glad to hear from him now or by letter.

O. D. Buzzell (Santa Fe): We have had a number of complaints of the Type "D" coupler not coupling. At excessive speed they did not couple due to the locking device being slow to act. I think this is a good feature. We were always after our switchmen to couple up easy but there has been considerable complaint about rough handling on the part of the transportation department and switching yards.

Another thing I have noticed is the rapid wear of the pin holes in the coupler eyes. How we can increase that area I do not know, but a considerable amount of play appears at that point in a very short time.

Mr. Kleine: Of course, we all remember the trouble with the old standard coupler due to pin holes wearing rapidly in line with the lock pin, but there cannot be any such wear in the Type "D" coupler. Do you refer to that coupler, or to others?

Mr. Buzzell: I refer to the Standard "D" coupler.

J. J. Tatum (B. & O.): Some very enthusiastic things have been said about this type of coupler; however, there have also been some complaints about hard coupling, and I believe it would be a good idea for those who know of any cases of trouble to bring them to the attention of the Coupler Committee.

F. W. Brazier (N. Y. C.): It must be very gratifying to Mr. Kleine and the other members of the committee to know that there are so few complaints with reference to Type "D" couplers. I think that this will be handed down to posterity, as one of the greatest things you have ever done.

(*A motion that the report be received and submitted to letter ballot was carried.*)

Report on Brake Shoe and Brake Beam Equipment

Last year this committee gave particular attention to brake beam reclamation and recommended in detail a process to be followed in repairing brake beams the purpose of which was to insure that the repaired beams might fully measure up to the capacity required of new beams. The report presented drawings and photographs of a simple but comprehensive set of special devices to facilitate assembling and testing reclaimed beams systematically and cheaply. This equipment can be built largely of second-hand material. An abstract of this report appeared in the Railway Age for August 20, 1921, page 369.

A further study of this subject prompts the committee again to emphasize the importance of having the repaired brake beam meet the requirements of the standard specifications, which can only be done effectively in properly organized central repair plants. The committee has under consideration the development of a standard brake beam design, in connection with which it will consider the advisability of adopting some form of brake head strength test.

THE PAST YEAR'S work of the committee has been principally the further study and consideration of subjects carried over from the previous year, as follows:

State of the Art, Brake Shoe Construction.—A careful analysis of the state of the art was made, supplemented by reports from the general counsels of the Eastern and Western Railroad Associations on the patent situation. The steel back brake shoe, illustrated, is the best that the committee has been able to develop not covered by patents. This design is recommended to letter ballot as Recommended Practice.

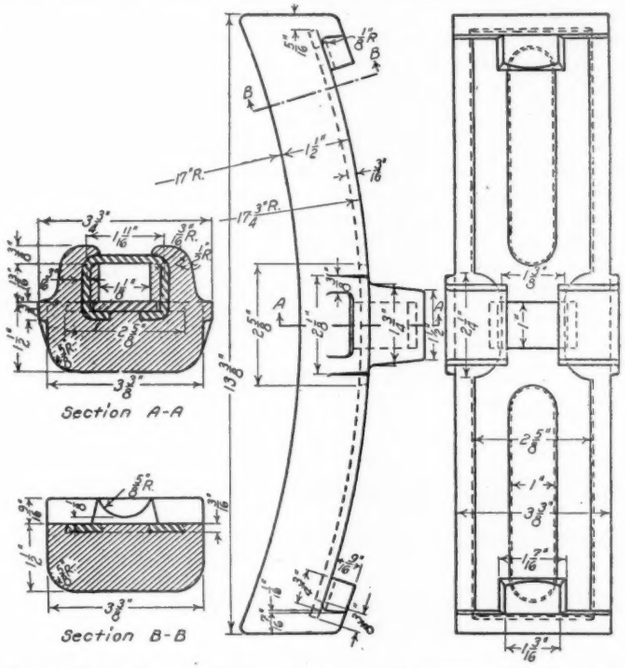
Reversible Strut.—Various forms of reversible struts, including those on the market and those suggested by different members, have been considered from the standpoint of demand and practicability. The committee feels that none of the designs have sufficient merit to warrant recommending them as Standard or Recommended Practice. The subject will be continued for further consideration.

Brake Beam Reclamation.—Last year the committee submitted as a progress report a tentative Standard Practice for the consideration of the members and requested their consideration and criticism. No criticisms or suggestions were offered. A further study of this subject emphasizes the importance of repaired brake beams meeting the capacity and other requirements of the standard specification. To handle this work most efficiently, properly organized

central repair plants, provided with special equipment for assembling and testing, are recommended. The equipment, while special in character, is inexpensive and can be constructed largely of second-hand material, as suggested and illustrated in detail in last year's report.

Brake Head Strength Test.—In view of the desirability of a standard brake beam design and the progress being made in that direction, and also the demand for improvement in present practice in brake beam maintenance generally, the brake head strength feature has been deferred for action in connection with the standard beam.

Brake Shoe Key Design.—A canvass of the situation developed that brake shoe keys conforming to the standard drawing and properly applied give little trouble. It is believed that an improvement can be made by lengthening the head from ½ in. to 1 in. and bending it over instead of upsetting it. This change is recommended for submission to letter ballot, as it involves a change in the standard drawing. It is further suggested that purchasers of brake shoe keys have such inspection made that will insure keys



Brake Shoe Proposed for Adoption as Recommended Practice

conforming to standard, and that railroads co-operate by having repair points use more care in maintaining better fitting keys, and when manufacturing their own keys to see that they comply with the standard.

Standard Practice Brake Beam Design.—The committee is not prepared at this time to submit a standard design of brake beam, and the subject will be continued.

Capacity Markings, Brake Beam Struts.—On suggestion made by the chairman of the Mechanical Committee, Brake Beam Manufacturers' Institute, the committee recommends for letter ballot changing Section 14 of the Standard Specifications for Brake Beams to read:

> The A. R. A. Nos. 1, 2, 2-plus, 3, 4, 5 or 6, as the case may be, shall be cast on the center strut with raised letters and figures not less than ⅝ in. high and ⅛ in. in relief, where they can be readily inspected when beam is in place on car.

The report is signed by W. J. Bohan (chairman), Northern Pacific; C. B. Young, C. B. & Q.; F. M. Waring, Penna. System; M. H. Haig, A. T. & S. F.; W. H. Coddington, N. & W.; G. E. Smart, Canadian National, and T. L. Burton, N. Y. C.

Discussion

Mr. Bohan: In view of the fact that there were no replies received to the circular in regard to brake beam reclamation, the committee earnestly desires that that subject be given as free discussion as possible.

C. E. Fuller (U. P.): I would like to have some of the car men here talk on the reclamation of brake beams. Brake beams are being reclaimed and put on cars in service, being of about as much use, as far as a practical brake beam is concerned, as if they were left off the car. It may be cheaper for the road applying that beam, but it is running the expense up on the other roads. I have a conviction that the reclamation of brake beams is a serious question. We evidently take the position that if a car has a brake beam on it it is all right and I think the car men who are here that are handling the beams ought to get up and say something. It is a matter of dollars and cents to us, and I for one would like to see some material saving on the brake beam problem. It is a pretty expensive item.

Chairman Tollerton: I think Mr. Fuller has touched on a very important subject. Brake beams are being reclaimed and returned to service which do not comply in any way, shape or form with the Master Car Builder's requirements. They are just there, that is all.

Mr. Fuller: It has been called to my attention and I have observed that brake beams have been applied by some railroads that had absolutely no tension in the brake beam. You could apply the brakes and almost bend the beam backward. Now, if the beam is worth reclaiming, it is worth reclaiming right, and if we cannot do it we should get someone else to do it. It is time that very careful attention was given to this matter of the reclamation of brake beams.

T. L. Burton (N. Y. C.): If the results of my observation, and the test reports we have in New York mean anything, Mr. Fuller is correct in what he says as to the manner in which some of the brake beams are reclaimed. The problem resolves itself into a matter of having adequate facilities for testing the brake beam, as recommended by the committee last year.

The New York Central, until comparatively recently, followed a practice which no doubt was in vogue on many of the other roads of so-called brake beam reclamation. At some of the minor plants each brake beam was taken apart and reassembled. There was some further work, such as pulling up the nuts on tension members and then the beam was restored to service.

In line with the committee's suggestion last year to collect some data as to what results were being had from the methods of reclaiming brake beams, the New York Central recently tested a large number of beams that had been reclaimed at its own shops and almost without exception these beams failed to meet the test requirements. We then removed these beams and loaded several carloads of the displaced, secondhand beams, sending an inspector with them to the manufacturer, who made necessary repairs. The beams were then subjected to the same test as called for in the specifications for the new beams and almost without exception they passed the requirements. The cost of restoring them to service under conditions was materially less than the purchase price of new beams.

In further compliance with the suggestion contained in the last committee's report on this subject, the New York Central is installing some of the facilities for subjecting the beams to proof test after we assemble them. I do not believe there is anything in connection with the brake beam proposition that is more worthy of consideration than the committee's report of last year on that particular item.

G. G. Juneau (C. M. & St. P.): We went very extensively into the question of the reclaiming of brake beams some years ago. Every little shop wanted to do some reclaiming. We started out to find what was being done in regard to the reclamation of the brake beams, and we dis-

covered that many of the shops did not have the necessary facilities for accomplishing the work, which was not being done according to standard practice. We then centralized the work at the main shop and it was discovered that testing machines were needed in order to find out whether the reclaiming was all right before the brake beam was sent out into service. We had apparatus which indicated whether the brake beam had the proper camber before we gave it a test.

We demand a certain capacity beam from the manufacturer, as Mr. Fuller said, and I believe we should all watch that particular feature closely in reclaiming brake beams and see that we are meeting the requirements demanded from the manufacturer.

The specifications for brake beams should be just as rigid for the reclaimed beam as for the new beam, and should give the service that we can expect in the case of a new beam. I was surprised to find the tension members of some beams I recently tested were made of channels and angles that had reduced in thickness of metal 25 per cent and more in some instances. How can we expect that metal so much reduced to give the strength in the beam that we require and how can we expect such beams when reclaimed to meet our specifications?

I believe there are other things in connection with our trucks and brake beams and brake attachments that should be considered. I found a number of brake beams in which the recommendations of the A. R. A. with regard to attaching the beam to the truck had not been followed.

There are other parts that should be given consideration. For example, in the winter time when there is snow and ice between the tracks, we find that the cotter pin is pushed in, resulting in the brake connection dropping down; some method should be adopted to hold the brake rod in position in case the cotter pin or connecting pin is worked off and lost from its position.

Mr. Bohan: As a matter of general information, I will say that the connections and attachments for brake beams are under consideration by the committee.

T. H. Goodnow (C. & N. W.): While the committee has called attention to the situation with respect to the reclaiming of brake beams, it has made no definite recommendation as to the cure, or rather the enforcement of it. We can hold a love feast here and then go home and continue to do about as we have done in the past. It seems to me that if the members of this Association are sincere in what they are expressing, a remedy can be found in the adoption of some rules similar to the rules with regard to the triple valve work. In other words, regulations could be embodied in the interchange rules providing that on and after a certain date brake beams failing to meet the specifications set up for the reclamation, and not having been tested on recognized testing machines, should not be applied to foreign cars.

If some regulation of that kind is set up, it will at least stop the application of reclaimed beams to other than owners' cars and that matter could be fully controlled because we would have the means of checking it as we now check triple valve work. I believe that if the Brake Beam Committee would take the matter into consideration and recommend something definite of that kind, the Arbitration Committee could take care of the framing of the rules. You can only bring it about by some regulation of that kind. If this is not done, in my opinion many of us will go along as we have done in the past.

(*A motion to accept the report and submit it to letter ballot was carried.*)

Report on Train Brake and Signal Equipment

Following the 1919 report the committee was requested to investigate and report on the question of standard capacity for retaining valves. A sub-committee was appointed to make tests and in 1920 the committee reported progress and asked for further time on the question of retaining valve capacity. This year's report recommends adopting as standard the present recommended practice which calls for a two-pressure spring type retaining valve without specifying the capacity.

The question of automatic connectors was likewise referred to the committee in 1919; the 1920 report stated that, owing to the magnitude of the subject, the committee had done little more than outline a plan to be followed in investigating it. This year's report indicates little progress has been made in the matter.

In addition the 1920 report recommended that the following subjects be included in the next year's work of this committee: Permissible Use of Brake Cylinder Packing Made of Leather Substitutes, Gages for Signal Hose Coupling, Adjustment of Brake Power on Freight Equipment Cars. No report has been submitted on these subjects.

THE committee on Train Brake and Signal Equipment submitted the following report on subjects which have been considered by the committee during the year:

PART I—Automatic Hose Connectors for Freight and Passenger Equipment

The subject of automatic hose connectors for freight and passenger equipment has been further considered by a sub-committee during the past year which reports in substance as follows:

One maker of automatic connectors reports having 15 locomotives, 12 passenger trains, 100 ore cars and 34 slag cars equipped with their automatic connector, and that tests are progressing favorably.

Another maker claims to have 5 passenger trains in Canada and one in the United States equipped with their type of connector and are working with certain railroad officials in the direction of developing a freight connector.

Further than this, the reports are in the general direction of development only.

It will be seen from the above that the trials in general now being made are in passenger service and the progress of development in automatic train connectors is not such as to put the committee in possession of information at this time that will enable it to make any definite recommendations on an acceptable design of connector for both passenger and freight service.

PART II—Revision of Code of Air Brake and Train Signal Rules

The present code of Air Brake and Train Signal Rules is in need of revision, and a sub-committee has been appointed from the

Train Brake and Signal Committee to work in conjunction with a committee from the Operating Division on revising the code.

PART III—STENCILING BRAKE CYLINDERS

Attention has been called to the fact that in many cases where the stenciling is above the transverse center line of the auxiliary reservoir it frequently becomes illegible through drippings from the car. Experiments have been made on at least one large railroad by stenciling below the center line , which indicates an improvement.

We believe the practice of applying the stencil approximately one inch below the center line should be followed, which can be done without conflicting with the present requirements from the fact that the location for the stencil is not specifically indicated.

PART IV—RETAINING VALVES FOR FREIGHT EQUIPMENT CARS

The committee recommends submitting to letter ballot for advancement to standard, the present recommended practice, two-pressure spring type retaining valve for freight equipment cars.

PART V—BRAKE BEAMS

At the request of the Car Construction Committee, the Committees on Train Brake and Signal Equipment and Brake Shoe and Brake Beam Equipment have held several joint meetings during the year in connection with the strength requirements of brake beams, and have submitted their recommendations to the Car Construction Committee on the proposed status of number two and two plus beams.

The report is signed by T. L. Burton (Chairman), New York Central; B. P. Flory, New York, Ontario & Western; J. M. Henry, Eastern Region, Pennsylvania System; L. P. Streeter, Illinois Central; R. B. Rasbridge, Philadelphia & Reading; G. H. Wood, Atchison, Topeka & Santa Fe; H. M. Curry, Northern Pacific; W. J. Hatch, Canadian Pacific and G. C. Bishop, Long Island.

Discussion

G. G. Juneau (C. M. & St. P.): I would ask the chairman of the committee, referring to the automatic connector, whether they have actually seen a test of the connector. Did the committee actually see the train broken up and the cars recoupled by the use of the connector?

Mr. Burton: A sub-committee, composed of Mr. Bishop (Long Island) and Mr. Hatch (Canadian Pacific), have, as individuals but not in the capacity of members of the committee, made the observations referred to in our inquiry.

J. M. Ryan (C. St. P. M. & O.): We have had a little experience with the automatic connector in passenger car equipment. The Canadian Northern has been operating a train at a large terminal for a year satisfactorily, and while I do not know what trouble they have experienced on the other end of the line, as far as we were concerned we experienced no trouble in that year. Just recently, for some unknown reason, the connectors were taken off. I inquired as to why and was unable to get a definite reply, but as far as our experience went the connector was a success.

B. J. Fogg (Grand Trunk): We have three trains equipped with the automatic train connector for test purposes; two of these trains run between Detroit and Grand Haven, a distance of 186 miles, and another train works between Battle Creek and Port Huron, a distance of 159 miles. These trains are equipped at both ends of the road and they are working out splendidly. They have been in service under tests for pretty nearly two years.

Mr. Burton: I might state, in connection with the automatic hose connector, the committee feels that there has been no test made up to date that will have an important bearing on the performance of the connector when applied to freight cars.

Passenger train tests, covering a run in many cases of small mileage and switched at one or both ends of the road, mean little compared to the movement of coupling and uncoupling which would occur on freight train cars in classification yards. There have been several test trains with the connectors run in passenger service, but we get from these movements little information about how the connector would work in freight service.

Mr. Tatum: I agree with our committee that we have got to go very carefully in establishing a decision on the automatic connector. The trains which are made up for testing get very careful attention, careful switching, and as a rule these cars are handled together, but when these cars get into general use, there will be difficulties to contend with. We have three different connectors under test and it is difficult to say what we might expect if they were in general use. (*It was voted that the report of the committee be accepted and the various items recommended by the committee submitted to letter ballot.*)

Report of Committee on Car Wheels

The committee has had under consideration the possibility of mounting wheels having the same physical characteristics on the same axle as a means of increasing their service life. It has reached the conclusion that the only practicable way of mating wheels of equal hardness is in the case of solid wrought carbon steel wheels, to pair those with a carbon content varying by not more than .05 per cent and in the case of cast iron wheels to continue the selection by tape sizes now covered in the recommended practice.

A few roads have been experimenting for the purpose of developing a chemical specification for cast iron wheels. The committee now has this subject under consideration and tentative specification has been prepared for the consideration of the wheel manufacturers. Owing to the number of interests affected, this is a matter requiring a thorough survey before final recommendations can be formulated and presented to the Division.

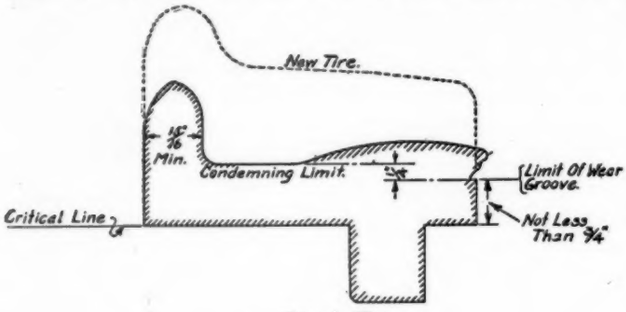
IN ORDER TO clarify the matter of condemning limits of steel and steel-tired wheels on account of wear, the committee recommends the following rule as Interchange Rule 79, under the freight car code and as a paragraph of Rule 7 of the Passenger car code:

"Thin tread: Steel and steel-tired wheels.—If tread is worn to within ¼ in. of the measuring line, which is the inside edge of the limit of wear groove."

There is recommended the introduction of an additional drawing in the code of rules to follow Fig. 4, now shown on page 220 of the 1921 revised code; also Fig. 4, M. C. B., sheet 16-A.

In 1920 the contour of the back of flange of steel and steel-tired wheels adopted in 1912 was withdrawn from the standards and the 1909 contour readopted as standard. With the 1912 contour the

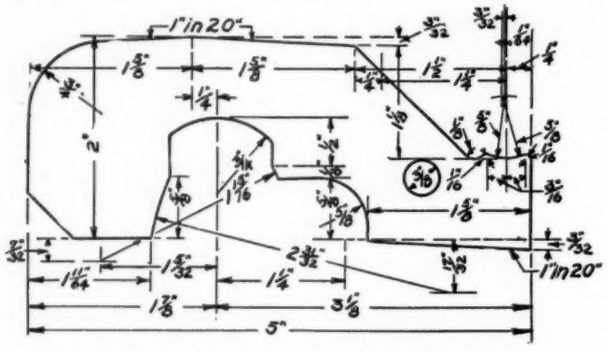
back of the flange of steel and steel-tired wheels was identical with that of cast-iron wheels between the base line and the top of flange. The 1909 contour reduced the width of the rim from 1 9/32 to 5½ in., and the backs of the flanges of steel and steel-tired



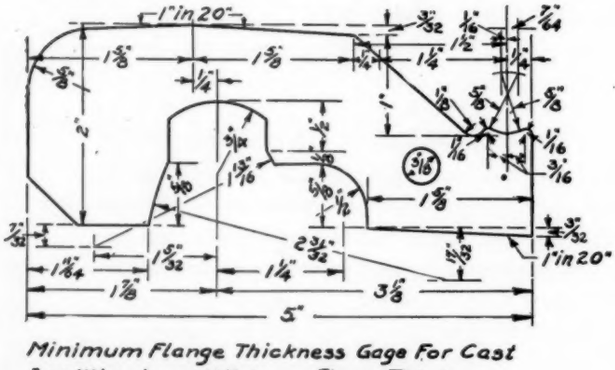
- Steel Tire
Recommended Practice.

Condemning Limit Drawing for Steel and Steel Tired Wheels Recommended for Insertion in the Interchange Rules

wheels are not now identical with those of cast-iron wheels between the base line and a point approximately ½ in. above it. Because of this change, the committee recommended that the drawing of the maximum and minimum flange thickness gages for cast-iron, solid steel and steel-tired wheels be changed to show the height of the



Maximum Flange Thickness Gage For Cast Iron Wheels and Maximum Flange Thickness, Height and Throat Radius Gage For Solid Steel and Steel Tired Wheels.



Minimum Flange Thickness Gage For Cast Iron Wheels and Minimum Flange Thickness, Height and Throat Radius Gage For Solid Steel and Steel Tired Wheels.

Recommended Change in Flange Thickness Gages to Conform to Present Standard Contour of Steel and Steel Tired Wheels

surface of ⅜ in. The proposed change will have no effect whatever as concerns cast-iron wheels.

An important factor in increasing the life of wheels is to pair and mount on the same axle wheels of as nearly as possible similar physical characteristics. Your Committee has considered the question of attempting to mate wheels of equal hardness, but it is their conclusion that the only practicable method of doing this is in the case of solid wrought carbon steel wheels to mate them within a .05 per cent carbon content range, and in the case of cast iron wheels to mate by tape sizes as already provided for in the recommended practice for mounting wheels. It is therefore recommended that the following section be added to paragraph 8 of the Recommended Practice for Mounting Wheels:

> "In the case of new wrought steel wheels, those mounted on the same axle should not differ in the carbon content by more than .05 per cent."

Your committee has under consideration certain revisions in the specifications for wrought steel wheels and cast-iron wheels. However investigation has not yet progressed sufficiently that it is ready to submit recommendations at this time.

The report is signed by W. C. A. Henry (Chairman), Penn. System. W. H. Winterrowd, Can. Pac.; J. A. Pilcher, N. & W.; O. C. Cromwell, B. & O. ; C. T. Ripley, A. T. & S. F.; H. Stillman, Sou. Pac.; L. K. Sillcox, C. M. & St. P.; H. C. Manchester, D. L. & W., and P. H. Dudley, N. Y. C.

Discussion

Chairman Henry submitted the report and at its conclusion said: The committee wishes to refer to the saving that will result from changing the condemning limits for cast steel wheels under certain conditions.

The present location of the limits of wear groove for wrought steel wheels was adopted in 1909. At that time these wheels were in the early stages of development and but little was known of their performance in actual service. Prior to the issuance by the Bureau of Locomotive Inspection, of limits the same as adopted by the M. C. B. Association in 1909, various railroads throughout the country established their own limits, some of which permitted greater wear than those now in effect.

One railroad has also conducted laboratory tests which clearly indicate that wrought steel wheels are of ample strength to permit greater than the present limits allow.

It is the opinion of your committee that solid wrought steel wheels, confined to switching service, may with perfect safety be worn to the limit of wear groove instead of one-quarter inch above it which is the present condemning limit for all classes of service. If this change were made, a very substantial saving would result, due to the opportunity to wear out in switching service wheels that now have to be scrapped.

The matter is brought up at this time so that those present may have opportunity to discuss it and give their views on the subject.

Mr. Goodnow: In connection with Mr. Henry's remarks, I would like to raise the same question regarding the interchange rule. Are you making that recommendation entirely as an interchange feature, or are you making it a general one, condemning the wheels as a matter of safety?

Mr. Henry: Questions that have been referred to the committee from time to time indicate that everyone does not understand just what the condemning limit is for a wrought steel wheel. This rule in no way changes the present standards but there seems to be some lack of understanding as to what the limit is. It can be readily determined by looking at the cuts and this recommendation is merely made with the idea of clarifying the situation.

Mr. Juneau: The committee recommends that a section be added to paragraph 8 of the recommended practice for mounting wheels. I would like to know what thought the committee had in mind in having the carbon content of the wheel given to the man mounting the wheel. In what way are you going to mark the wheel so that he will know what he is doing at the mounting press?

Mr. Henry: It is the practice of some roads either to have the wheels marked by actual figures showing the carbon content, or by some arbitrary series of letters, such

as A, B, C, and such roads are following the practice of making the wheels within this range with the thought that the carbon contents being close, the wheels are more nearly of the same hardness and that under those conditions better mileage is obtained.

Mr. Juneau: It would seem to me that the committee in recommending this change or addition to the paragraph should recommend some way of marking the wheels so that they will all work alike.

Mr. Henry: The committee felt, as this is merely a recommended practice, that if this recommendation met with the approval of the Association it might be desirable to go further in the matter. This is merely a recommendation.

Mr. Henry: The wheel manufacturers at present furnish to each mill a statement showing the carbon content from which this information can be derived. The committee had not gone to the extent of including in the specifications for wrought steel wheels anything covering the subject.

J. E. Mehan (C. M. & St. P.): Supplementing the remarks of Mr. Juneau, I notice that new wrought steel wheels, when mounted, shall not have a carbon content of more than .05 per cent. It strikes me that is a good requirement for new wrought steel wheels and it ought to be equally good for re-turned wheels. The point of having a uniform marking, to my mind, is very essential for the reason that if we return wheels from other roads in order to get uniform wheels on the same axle, we ought to know the other fellow's method of determining the carbon content. For that reason it strikes me there should be some uniform method.

Mr. Fuller: I am inclined to believe that this recommendation is impractical. We are depending entirely on the manufacturers to know the carbon content of these wheels. Everybody understands that the committee could not mount a pair of wheels, both having the same carbon content, without due respect to the tape sizes. The wheels would have to be marked by the manufacturer, or you would get my wheels and not know whether they contained .05 per cent or what the amount of carbon was. I do not believe that you can live up to it, even if the wheels are marked.

Mr. Tatum: The limit groove, shown in Exhibit A, is ¾ in. from the bottom and the condemning limit shows ¼ in. above that limit groove. Suppose the metal was 5/16 in. thick at that point and the car was offered for interchange; should it be accepted?

Mr. Henry: Yes, sir.

C. T. Ripley (Santa Fe): It has been found practicable to make wheels in accordance with the carbon content, varying not more than .05 per cent, and merely marking that group by letters. The results which can be secured are somewhat questionable, but we feel there is a chance of better wear. Inasmuch as we can take that chance with practically no extra expenditure either in first cost of the wheel or work in the repair shop, it is worth going after. As regards marking old wheels, the difficulty is that many of the roads (and they have a good argument for so doing) dismount wheels where but one wheel is worn. Therefore, the committee did not care to make any rule regarding worn wheels. When it comes to the scrapping limit of rolled steel wheels, I think this is a bigger subject than appears on the surface. For years we have been throwing away rolled steel wheels by hundreds and thousands with an inch of metal in the tread. The wisdom of this is somewhat questionable. We started with tires and had such a limit. The rolled steel wheel gradually developed and we followed the same practice for two reareasons: First, we knew very little about what we could get out of the rolled steel wheel, and second, some of the roads felt their coupler heights would be involved. Some roads have cars and locomotive tenders which could use wheels worn down ¼ in. further. If it is safe to use a rolled steel wheel with ¼ in. more wear in service, it would mean the saving of hundreds of thousands of dollars to our railroads. In order to find that out, some experiments have to be made. First, we can go into the laboratory and make drop tests with testing machines to determine the strength of the flanges. Second, we can observe our failures on the line. Indications from both these tests show that we have not gone as slow on rolled steel wheels as we should. The limit of wear on rolled steel wheels is governed by the distance from the throat to the underside of the rim on the back. We run into a sharp corner at this point which would tend to make breakage improbable. With a full radius at this point, we have a 1⅜-in. limit. This does not seem fair to the rolled steel wheel. I do not think anyone wishes to take any chances of accident but on the other hand we do not wish to throw away material which is really serviceable. In order to try this out in service, it was thought switch engine service might give us some figures before a further step was made or before recommending its general use. We hope some figures will be obtained in that way which will aid us in this study. The general feeling is that the failure of a flange on a rolled steel wheel is not due to the tread being thin or this dimension being down to 1⅜ in. but due to a defect in the wheel.

James Hall (So. Pac.): The present method of gaging the service metal on rolled steel wheels is, in my opinion, far from satisfactory.

Our book of rules instructs us to measure the service metal from the base of the measuring line, this line to be not less than ¾ in. above the critical line, but it makes no provision for the measuring line being more than ¾ in. above, which is very frequently the case. It is my opinion that we are sustaining a loss of thousands of dollars yearly, in wheel service by this practice.

Our standard drawings show the measuring line as ¾ in. above the critical line, and the condemning limit or line of wear, ¼ in. above that, leaving a thickness of one inch of metal above the critical line, which no doubt, is ample for safety.

Our specifications for new wheels require a measuring line not less than ¾ in. above the critical line and not less than 1-¾ in. of metal above the base of measuring line, thereby assuring us at least 1-½ in. of service metal or 2-½ in. total thickness of rim.

The manufacturers evidently do not confine themselves strictly to these dimensions, in many cases furnishing a wheel which exceeds 2-½ in. in thickness and instead of placing the measuring line ¾ in. above the critical line, they place it 1-¾ in. below the base line at the top of the tread. This practice can not be objected to as it fulfills all requirements, but, when gaging worn wheels as to their scrap limit, or actual thickness of service metal, the extra metal below the measuring line should not be overlooked.

We often find wheels with the measuring line ⅞ in. or 1 in. above the critical line and if we were to condemn such wheels by taking the measuring line as a basis, as we are instructed to do in the book of rules, we would then be throwing away from ⅛ to ¼ in. of valuable service metal.

As the actual thickness of metal in the rim of the wheel determines its value and as one inch has been decided as the limit of wear, why not keep them in service until they have reached that limit, disregard the measuring line, and measure the actual thickness above the critical line? The measuring line is evidently placed there to aid wheel inspectors in determining the amount of metal in the rim but I can see no particular use for it. It is just as easy to measure the actual thickness if a proper gage is used, and,

with that end in view, I wish to submit for your consideration a service metal gage which we have been using for some time and which I feel, meets all requirements. The gage is simple in construction, easy to apply, and gives a direct reading of the actual amount of service metal above the condemning limit.

There is another point to be considered when gaging worn wheels. There is a condemning limit of 1-⅜ in. of metal through the throat of the flange taken at the back or inner face of the wheel. It has been found that the critical line at the front, or outside face of the wheel, and that at the back or inside face do not in all cases coincide, and while a wheel might have the required amount of metal at the outside, it may have reached the limit of wear of 1-⅜ in. at the back or inside, which might be overlooked.

The gage submitted provides for that, the tail of the gage which extends along the back of the wheel being graduated and a scrap limit mark provided. These graduations are not intended to give the exact amount of metal through the throat of the flange, but merely to act as a precaution against going below the 1-⅜ in. scrap limit. The gage is also provided with an attachment for determining the amount of metal necessary to remove from the tread in order to restore contour, the graduations indicating in sixteenths of an inch the depth of cut to be taken.

I would recommend abolishing the measuring line as now applied, as in my opinion it is misleading and of no practical use, and would recommend also the adoption of the gage submitted, or one similar to it as a substitute for the one shown on plate C. 1, Standards and Recommended Practice.

O. C. Cromwell (B. & O.): Several members of the wheel committee have paid considerable attention to the condition of the worn wheels, when removed for returning. Many times you have one pair of wheels worn to a thin flange, and the other a relatively thick flange or nearly new. When that condition prevails, you get only half the mileage that you should get if you wore the two flanges an equal amount. Uniformity of carbon content assists in giving wheels more nearly of the same hardness, and you get more even wear of the flange. The flanges of the rolled steel wheel before we remove it, we will effcast iron wheel flanges, and in the cast iron wheel, we have a means for mounting wheels of extreme hardness, which we do not now have in the rolled steel wheels, that is the tape measurement, and this gives you more nearly an equal wear on the flanges of the wheel than you get with the rolled steel wheel. If we can increase the mileage of the rolled steel wheel before we remove it, we will effect considerable economy in operation. As regards reducing the limit of wear, in line with the limit of wear groove, the figure of 1⅛ in. was established on the line of steel tired wheels as the only basis with which we could measure and in those cases the under side of the rim was cut or turned that gave you about ¼ in. less metal than you have now with rolled steel wheels which are slightly tapered on the under side of the tread. In order to get some experience in actual service, the committee thought it would be a proper thing to try those wheels out in tender service.

Mr. Juneau: I feel satisfied that the committee is on the right road, in their recommendation so far as the carbon content is concerned, but I want to be satisfied as to how we are going to convey that information properly, to the wheel mounter. We must have some means of doing that.

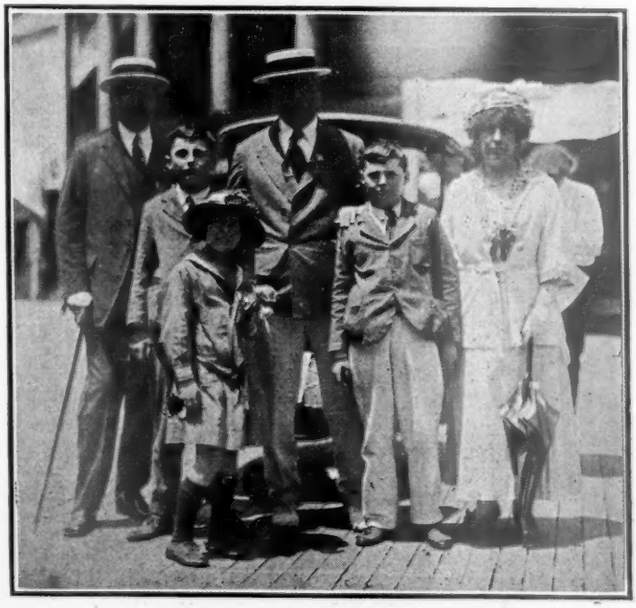
Mr. Ripley: I think that the carbon content numbers or letters should be put on at the manufacturers' plant, simply stamped along with the heat number, etc., on the inside of the rim. Instructions could then be issued to the wheel man as to what the symbol means. It should be understood that the number represents heat analysis and not an individual analysis of any kind, so there will be no variation in the wheels.

Mr. Pilcher: I believe the mating of wheels by carbon content is a very desirable thing and if it can be accomplished with the classification under group letters (four or five in the range of carbon content) it would be very desirable. In regard to the question of wearing the wheels thinner than at present, the ruling we now have is a law and we are not allowed to go below the limit of wear. As I understand the proposition, the ruling was set upon the basis of recommended practice by the Master Car Builders' Association, based upon their experience. They were playing very safe. In the Norfolk & Western, we were conducting a series of experiments in regard to running wheels thinner so that we could operate the wheels with as much economy as possible. We had run the wheels safely ¼ in. thinner than they had been set, and we feel that it would be safe if we could get a ruling at least locally in switching service, until we develop the experiments further. As pointed out very clearly by Mr. Ripley, the analogy for the thickness of the rims on rolled steel wheels was made by comparison with the steel tired wheels. But there is a very large fillet between the rim and the plate on the rolled steel wheels, which adds materially to the strength, the whole structure being tied together as one.

I do not know how we could get this thought impressed in such a way that we could get action from the Interstate Commerce Commission, permitting these experiments that we have in mind. We certainly hope their rulings may not be changed in the future, regarding experiments. There have been some laboratory tests, conducted particularly under the auspices of Prof. Hennessey. The test is so much in faver of the cast steel and wrought steel wheel, as compared with the cast iron wheel, that we could easily draw the analogy that these two wheels could be run safely with a very thin rim.

(*A motion to accept the report was put to a vote and carried.*)

(The meeting then adjourned.)



Sir Arthur Conan Doyle with wife and family after looking over the Exhibits—a Friend at the left.

R. S. M. A. Meeting and District Elections Today

THE DISTRICT MEETINGS for the election of members of the executive committee will be held in the executive committee room, next to Secretary Conway's office, from 10:00 to 11:30 o'clock this morning. Two new members must be elected to succeed Charles W. Beaver and H. G. Thompson in the second district, whose terms of office expire. One member must be elected in the fourth district to succeed George A. Cooper, whose term expires, and one must be elected for the same district to succeed Edward M. Savercool, who has moved out of the district.

The annual meeting of the Railway Supply Manufacturers' Association will be held in the Greek Temple of the pier at noon today.

Sunday Sacred Concert

A SACRED CONCERT will be given on Sunday at the Marlborough-Blenheim at 3.30 p. m. under the direction of a committee made up of Aden R. Miller, chairman, W. J. Carrigan, Oscar C. Hayward and W. R. Walsh. The following program has been arranged:

1. Indian Love Lyrics.....Woodford-Finden
   Orchestra
2. "Soldiers Chorus"—Faust.....Gounod
   Criterion Male Quartette
3. "The Pipes of Gordon's Men".....Hammond
   Mr. Simonds
4. "Billa Nelle".....Dell Acqua
   Mrs. Emily Stokes Hagar
5. "Swing Along".....Cook
   Criterion Male Quartette
6. Cello Solo
   a—Elegie.....Massenet
   b—Le Cygne.....Saint-Saens
   Mr. Lucian Schmit
7. a—"The Star".....Rogers
   b—"Song of the Open".....Laforge
   Mrs. Emily Stokes Hagar
8. a—"Blue are Her Eyes".....Watts
   b—"Until".....Sanderson
   Mr. Carmint
9. "Italian Street Song"—"Naughty Marietta".....Herbert
   Mrs. Hagar and Quartette
10. a—Prelude du Deluge.....Saint-Saens
    b—Hymn to the Sun.....Rimsky-Korsakoff
    Orchestra

Registration, American Railway Association, Div. V, Mechanical

Alexander, I. R., Retd. Gen'l. Rd. Fore. Eng., Penn.
Anderson, F. W., Gen. For., Penna.
Ayers, A. R., S. M. P., Nickel Plate, Marlborough.
Baldinger, F. A., M. M., B. & O., Clarendon.
Barton, T. F., M. M., D., L. & W., Traymore.
Beacon, T. H., V. P. & G. M., C. & R. I. P., Ritz Carlton.
Bennett, W. H., Insp. Ch. of M. P., Penn., Martinique.
Bingman, P. R., G. F., Penn., Martinique.
Bowden, J. F., M. M., B. & O., Clarendon.
Burnham, W. D., G. F., B. & O., Castro.
Burns, John, W. Mgr., C. P. R., Ambassador.
Butt, F. W., Asst. Eng., N. Y. C., Runnymede.
Cahill, M. H., V. P., Seaboard Air Line, Marlborough.
Chapman, E. E., Engr. Tests, Santa Fe, Chalfonte.
Cole, W. C., F. Steel Shp., Penn., Carnix.
Conniff, P., Asst. S. M. P. & Mich., F. E. C., Elwood.
Coulter, A. S., Comm. Agt., Penn., Princess.
Courson, J. F., Gen. For., Penn., Seaside.
Dambach, C. O., Gen'l Mgr., Unity Ry. Co., Alamac.
Davis, A. C., S. M. P., Penn., St. Charles.
Demarest, G. L., Chf. Clerk, C. D., C. R. R. of N. J., Sterling.
Denney, C. E., Nickel Plate, Ritz Carlton.
Dickerson, T. B., Supt. Loco. Shop, C. R. R. of N. J., Sterling.
Ditmore, Archie G., Div. Car. For., D. & H., Monticello.
Diven, J. B., M. M., Penn.
Ennis, J. B., V. P., Amer. Loco. Co., Traymore.
Fahnestock, McClure, Asst. M. M., Penn.
Farrington, T. B. M. M., Penn., Traymore.
Ferguson, Geo. G., Insp., Penn.
Feuse, Frank, Gen. For. Car. Dept., L. V., St. Charles.
Fletcher, J., G. F. C. D., Seaboard Air Line, Strand.
Force, H. J., Engr. of Tests, D. L. & W., Traymore.
Fredricks, J. T., Gen'l. Mgr., M. P., Princess.
Fry, L. H., Gen. Insp., Baldwin Loco. Works, Brighton.
Goddard, E. E., Gen'l. El., Penn., Dennis.
Grim, Charles B., F. C. S., Atlantic City Rys.
Harris, A. A., M. S., N. Y. N. H. & H., Haddon Hall.
Hassett, John C., M. E., N. Y., N. H. & H., Traymore.
Heald, W. B., Supt. Const.
Hedley, Frank, Pres., Interborough Rapid Transit, Shelburne.
Henry, H. B., Asst. Dir. of Pur., S. P., Traymore.
Hertz, D. F., Dis. M. P. Insp., B. & O., Adelford.
Hodges, A. H., M. M., B. & O., Adelford.
Hogan, C. H., Man. Dept. Shop Labor, N. Y. C., Marlborough.
Hogan, P. J., Gen. Car For., N. Y., N. H. & H., Pennhurst.
Hooper, M. B., M. M., C. & J., Ambassador.
Hooper, N. H., P. A., Cambria & Ind., Ambassador.
Hopkins, J. W., M. M., E. & A. Div., Traymore.
Huber, H. G., Asst. Engr. M. P., Penn., Haddon Hall.
Jones, L. B., M. M., Penn., Dennis.
Kapp, J. B., M. M., Penn., Haddon Hall.
Keegan, J. E., G. C. Insp., Penn., Haddon Hall.
Kelly, R. J., F. M. P., L. I., Shelburne.
Keppelman, H. L., Gen. Car Insp., P. & R., Haddon Hall.
Kiessling, E. W., F. C. Insp., Penn., Netherland.
Lacy, H. S., P. A., Jackson. Terml., Princess.
Larsen, Chas. A., G. C. F., N. Y. N. H. & H.
Lee, F. H., Supr. Frt. Car Main., Alamac.
McCahey, R. E, M. M., R. F. & P., Dennis.
McGill, A. M., Asst. S. M. P., L. V., Princess.
McGraw, John C., Travel Engr., P. & R., W. Phila.
McIntosh, James, M. M., N. Y. N. H. & H., Haddon Hall.
Manchester, H. C., S. M. P. & R. S., D. L. & W., Traymore.
Marks, Geo., Asst. to G. M., N. Y. N. H. & H., Shelburne.
Mills, J. S., For., L. I., Elberon.
Moore, A. F., Gen. For., Penna., Schlitz.
Murphy, T. J., Asst. to P. A., B. & O., Strand.
Noble, H. S., Asst. M. M., Penn., Chalfonte.
O'Neal, James, Gen. Car For., G. M. & N., Princess.
Poole, E. P., Supvr. of Shops, B. & O., Chalfonte.
Porcher, Samuel, G. P. A., Penn.
Prater, E. P., M. M., M. P., Princess.
Quinn, Maurice A., Gen'l. Fore., D. L. & W., Bothwell.
Reed, John, Supt. of Shops, N. Y., N. H. & H., Princess.
Richards, E. C., Asst. T. S. A. S., M. C., Ambassador.
Robb, E. H., Asst. S. M. P., L. I., Dennis.
Rossiter, C. A., Gen. For. Car. Dept., Wash. Term., Elwood.
Rueger, H. A., For., L. I., Elberon.
Russum, T. N., S. P. C. D., B. & O., Dennis.
Sage, R. V., Car Eng., Cambria Steel Co., Marlborough.
Sakers, Ross C., Sec. to Purch. Agt., Penn., Princess.
Sears, E., Dist. & Elec. M. M., C. M. & St. P., Chalfonte.
Sellman, F. E., Asst. M. M., Penn.
Shafer, S. W., C. C. to Pur. Agt., C. R. R. of N. J.
Shelton, E. M., Supt. Loco. Supp., D. L. & W., Strand.
Shull, G. F., M. M., Clinchfield, Ohio, Princess.
Sloan, J. R., Chief Elect., Penn.
Smith, Abram E., V. P., Union Tank Car Co., Traymore.
Smith, H. J., Gen. Car Insp., D. L. & W., Sterling.
Smith, John L., G. F., P. & L. E., 125 S. Illinois.
Snyder, F. M., G. F., Penn., Fredonia.
Speck, N. J., G. F., Penn.
Stanton, E., C. J. Car Insp., N. & P., Osborn.
Stedman, W. M., Chf. Chem., B. & O., Arlington.
Stevens, J. R., Chf. Eng., M. P., Princess.
Stevens, F. J., M. M., N. Y. & Q.
Stofflet, Howard A., Elec. Eng. M. P. D., P. & R., New England.
Stohlberger, Phillip, M. M., M. P. & R. E. Dept., Atlantic City.
Straub, C. F., Supvr. Car Repair Bill Bur., P. & R., Orville.
Stubbs, G. W., M. M., K. & E., Arlington.
Sweeley, F. H., G. F. Loco. Shops, L. I., Dennis.
Telford, A., Asst. Gen. P. A., Southern, Haddon Hall.
Tutt, T. I., Pres., Penna. Tank Car, Traymore.
Vaugundy, C. P., Water Eng., B. & O., Arlington.
Waller, E. B., Ch. E. E., Canadian National.
Walsh, F. O., S. M. P., A. & W. P., Strand.
Walther, E. W., Asst. to P. A., B. & O., Strand.
Weight, G. C., G. Car Insp., Penn., Worthington.
Wheeler, Richard H., Genl. Mgr., Olean, Brad. & Sala., Arlington.
Whitely, Geo., Asst. S. M. P., C. P., Ambassador.
Whitman, E. B., M. M., Penn.
Whitsitt, W. B., Chf. Draft., B. & O., Shelburne.
Wieseckel G. F., S. M. of E., Retired, Dennis.
Willson, L. M., M. M., Penn.
Wintersteen, John, M. M., Cornwall, Traymore.
Wyman, R. L., M. M., L. & N. E., Pennhurst.
Yergy J. P., G. F., Penn., 817 Pacific.

Special Guests

Apgar, Albert R., Electrician, Penn.
Ardis, L. T., For., Penn.
Baba, Kumeo, Gov't. Insp. Elect. Loco., Imperial Gov't Railroads, Japan, Princess.
Bachman, E. L., Asst. M. M., Penn.
Bailey, R. W., Car Shop Insp.
Bainbridge, Howard N., For., L. I.
Baker, G. H., Spl. Agt., Amer. Ry. Co., Atl. City.
Bartmillington, Wilbur, Cornwall, Traymore.
Barton, E. O., For., Penn.
Bateman, Frank, Dir., Atlantic City Railroad.
Becker, E. E., Erect. For., L. I., Clarendon.
Bracken, J. L., Asst. Elec., Engr., N. Y., N. H. & H., Chalfonte.
Brackett, C. A., Genl. For., Penn., Princeton.
Buell, C. J., G. S., Duluth, Mis. & Nor.
Burleigh, G. S., Asst. Supt. Shops, C. & N. W., Strand.
Burns, Thomas, Asst., For., M. P. & R. R. Dept., P. & R.
Canning, John R., Welding For., N. Y., N. H. & H. Traymore.
Clarkson, A. J., Asst. Eng., N. Y. C.
Cornwell, H R., For., Wash. Term., Warwick.

Conventionalities

J. E. Simons of the Joliet Railway Supply Company is attending his twenty-eighth convention.

Miss M. Olive Cromwell is accompanying her father, O. C., of the Baltimore & Ohio, to the convention this year. Mr. Cromwell is especially interested in gasoline motor cars just now.

Mr. and Mrs. John P. Landreth are accompanied to the convention this year by Mrs. A. L. Eustice, also of Chicago. Mrs. Eustice is a sister of United States Senator Arthur Capper of Kansas.

George N. DeGuire, assistant to the manager of the department of equipment of the United States Railroad Administration, drove over from Washington in his car with Mrs. DeGuire, arriving here Wednesday afternoon.

F. M. Whyte, formerly chief mechanical engineer of the New York Central, is back at the convention again this year, having returned recently from Australia where he served as a member of the Uniform Gage Mission of the Australian Railways.

Those who know Le Grand Parish and his organization, know Miss Lawton. She is here—for her first convention. Not as a buffer for her worthy chief, but as a "holder-on" to keep them happy while waiting to hear all about the new double arch.

Almost continously for the past 40 odd years H. M. Perry has attended the mechanical conventions. He joined the M. C. B. Association at the first meeting in Chicago and is probably the only surviving member who attended that meeting. Thirty years ago Mr. Perry took out his first side bearing patents.

W. P. Borland, chief of the Bureau of Safety of the Interstate Commerce Commission, looks as if he had been having a strenuous time of it lately. No doubt he has, since it has been necessary for him to follow critically all of the proceedings in connection with the automatic train control and the power brake hearings.

A. L. Humphrey, without whom a convention would hardly seem complete, is able to make but a flying week-end visit this year. He arrives this morning but will be able to spend only Saturday and Sunday with his many old friends. Mr. Humphrey sails with his wife and son Fred on June 24 for a few months' tour of Europe.

It is with pleasure that we announce the election to the board of directors of the Murphy Varnish Company of Claude M. Baker. Mr. Baker is attending the convention this year, as has been his custom for many years. His connection with the Murphy interests has been one of long standing. During the past three years he has been sales manager at Chicago.

Ethan I Dodds got in a day late this year. He motored down from central valley, N. Y., and had to make a number of detours. This is not entirely responsible for his delay, however. His daughter Dorothy was married in the chapel at West Point at high-noon on Wednesday to Alva Carlton Spalding who was graduated from West Point on Tuesday.

J. W. Brashears, director and superintendent of manufacturing of Dearborn Chemical Company, has been connected with the company continuously for 28 years and somehow had managed to stay away from the conventions all that time. He finally visited Atlantic City this year and like most of those attending for the first time, was greatly impressed with the exhibits.

Le Roy Kramer comes to the conventions this year as vice-president of the Symington Company. Mr. Kramer left the vice-presidency of the Pullman Company during the war to become federal manager of the St. Louis-San Francisco Railroad. On the termination of government control he became vice-president of the Willys-Overland Company at Toledo, Ohio. He is happy to be back among his old associates in the railroad and railroad supply businesses.

Business is improving. Clyde P. Ross, contracting manager of the Roberts & Schaefer Company, is here and is wearing a smile. He reports that his company has recently secured contracts for four of the largest fireproof coaling and sanding plants ever built in the United States. The orders came from the Delaware & Hudson, Michigan Central, Chicago & North Western and Chesapeake & Ohio. Mr. Ross is accompanied by Mrs. Ross.

"Dan" Brady is looking fine, although he passed through a most severe illness during the latter part of the winter. Dan was given a testimonial dinner by a large group of his friends at the Commodore Hotel, New York, May 18, 1922. The toastmaster was H. H. Vreeland and the speakers were Judge Morgan J. O'Brien, Hon. Luke Stapleton, John A. Dwege of the New Haven; Col. Charles DeLans Hine, President Besler of the Central of New Jersey, and President Hustis of the Boston & Maine. President Hedley of the Interboro, presented Mr. Brady with a bronze statuette.

A delegation of well chosen convention attendants is here from a New England road—the Boston & Maine. There are 12 in all: L. G. Coleman, assistant general manager in charge of maintenance of equipment; C. H. Wiggin, superintendent of motive power; C. B. Smith, mechanical engineer; E. T. Millar, general car inspector; J. Craig and R. W. Band, general shop inspectors; Tom Jennings, D. E. Davis and F. H. Eddy, shop superintendents; C. S. Hall, master mechanic; H. A. Bliss, general air brake inspector; J. E. Gardiner, air brake instructor, and P. J. Callahan, supervisor of car and locomotive electric lighting.

L. K. Sillcox, general superintendent motive power of the Chicago, Milwaukee & St. Paul, who has been nominated this year as a member of the general committee of the Mechanical Section, will not be able to come to the convention because of a number of important matters requiring attention at Chicago. The St. Paul has recently ordered both locomotives and cars. The road has also taken over the Chicago, Terre Haute & Southeastern, which serves the Illinois coal fields, and Mr. Sillcox is giving special attention to getting the equipment on this road in condition for handling the heavy business that is anticipated when the coal strike is settled.

Among those attending the convention this year are three men who have played an important part in one of the latest developments in aerial transportation, the production of helium for lighter than air craft. M. H. Roberts, of the Franklin Railway Supply Company, is chairman of the Helium Board of Engineers of the United States Government. Associated with him are Harvey N. Davis, professor of Mechanical Engineering and Physics at Harvard University, best known as one of the authors of the Marks and Davis Steam Tables, and Professor W. DeBaufre of the University of Nebraska, a specialist in heat transfer, who served during the war as a member of the research department of the navy at Annapolis.

One of the veteran visitors at the conventions who will be missed by many persons this year is Frank S. Dinsmore, who died last February. Mr. Dinsmore became connected with the *Railway Age* in 1897, and attended his first convention that year at Old Point Comfort. He attended the mechanical conventions every year that they were held from then until his death. He was one of the workers on the *Daily Railway Age* almost from its inception, and helped get it out in years when it was much smaller but when the difficulties of editing and publishing were even greater than now. No man ever lived who more universally commanded the affection and respect of those who knew him than Mr. Dinsmore, and his passing is a great loss to his many friends.

N. W. Storer of the Westinghouse Electric & Manufacturing Company is attending the convention. Mr. Storer is one of the most prominent railway electrification engineers in this country, having been for more than 30 years in the railway engineering department of the Westinghouse Company and in intimate touch with railway problems since 1891. He is a pioneer in early electrification development and an authority on high-voltage direct-current electrification. Mr. Storer was associated in the designing of the most powerful freight locomotive in the world, an experimental 4,000-hp. electric locomotive, operating in freight service on the Pennsylvania Railroad around Philadelphia, and also of the electrical equipment of the Paoli suburban electrification operation out of Broad street terminal.

The Northern Pacific has a representative party attending the conventions—men from all departments, well selected to absorb all phases of the business discussed during the convention. Eight representatives of that road have come from the great northwest and are registered as follows: J. P. Anderson, shop superintendent, Brainerd, Minn.; W. J. Bohan, assistant general mechanical superintendent, St. Paul; C. E. Emerson, master mechanic, Dilworth, Minn ; George F. Endicott, assistant master car builder, St. Paul; Charles J. Mitchell, roundhouse foreman, Missoula, Mont.; J. H. Remick, M. C. B. billing clerk, St. Paul; Josepr Zuber, roundhouse foreman, Mandam, N. D.; and Silas Zwight, mechanical superintendent, lines east, St. Paul. By such careful choosing of convention attendants it is possible for the railways to derive the greatest benefits from the convention.

B. B. Milner, formerly with the Pennsylvania Railroad and later chief mechanical engineer of the New York Central, who resigned two years ago to become associated with Fraser & Co., Japanese importers and exporters, and who is now consulting engineer to the Japanese Government Railways, writes that his headquarters are at the Government Railways office at Tokyo. Milner still "hits the trail", for he writes under date of May 21 that he has covered, since March 1, the lines north of Tokyo, including some 1.200 miles on the northern island of Hokkadio, and was just preparing for a quick trip over Korea and Manchuria which would lead him as far as Harbin on the Chinese Eastern. We miss Milner this year, but a good many of his friends are "sporting" the very handsome Japanese canes which were sent over in time for 1921 convention which failed to materialize. Milner will be glad to hear from his friends when the spirit moves.

J. H. Cooper, who represents the Dearborn Chemical Company, the Bradford Draft Gear Company, the Pilloid Company, Fairbanks, Morse & Co., and a few other concerns in Mexico, has come on from his home in Mexico City to attend the conventions. Mr. Cooper believes that President Obregon of Mexico is a very able man and that if his government receives outside recognition, especially from the United States, he will be able to maintain peace and restore normal conditions. The general situation in the country, he says, is improving daily. Mr. Cooper states that much work and a large expenditure are still required to put the Mexican Railways in good shape. Much is being done to repair and improve the track. In the months January to April, inclusive, 1,452,000 ties were distributed to be put in track, although probably not all were actually laid. Little new rail has been laid recently, but the railways have arranged to get rail from the Monterey Steel Company. Mr. Cooper is optimistic regarding the future course of events in Mexico, provided President Obregon is given a fair chance by the governments of other countries.

Do you know Asheville Johnston? You may think you don't, but you probably do, or at least have heard of him. He has and deserves the reputation of possessing the most remarkable memory on the Boardwalk. Asheville is the hat boy at the entrance to the American dining room of the Marlborough-Blenheim Hotel, and, without knowing his name, you probably have marvelled at the fact that, without checking them at all he almost invariably returns promptly to the right persons the many hats and canes that are left with him. Asheville has been at the Marlborough-Blenheim since 1908. "How do you do it?" he was asked yesterday. "Well," he said, "I always did have a good memory, and I have cultivated it. When a man hands me a hat, I take a good look at him and the hat, and associate them in my mind. Then, when he comes back, I take a good look at his face, and that recalls the appearance of what he gave me and the place where I put it. It is easy, of course, to do this for many of the people coming to the conventions, because they have been coming here a long time, and their faces are familiar to me. That's all there is to it." That isn't all there is to it, though, as everybody who has seen Asheville in action will testify. Such memories as his are born, not made.

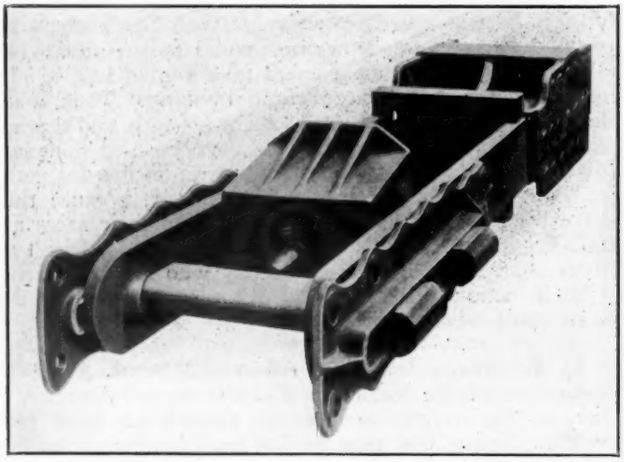
C. F. Fritz, manager of mines and South American properties of the Vanadium Corporation of America, is here at the convention after an absence of about four years. During that time he has been in Peru enlarging and developing the company's mines. Mr. Fritz has had a most interesting experience. The mines are located in an almost inaccessible part of the country, at an elevation of about 16,000 ft. above sea level. He has been called upon to avail himself of almost every mode of transportation known to man. In the first place it was necessary to get material for new construction at the mines in order to increase production. Mr. Fritz found it necessary to transport this material on men's backs, mules, horses, oxcarts, llamas, rafts and later by motor trucks. He has built a narrow-gage line about seven miles long with a drop in elevation of 1,200 ft. from the mine to the top of a bluff some 500 ft. above a lake some 10 miles long, and has established a system of barges for transporting the ore across the lakes, the barges being handled by motor boats. This lake is undoubtedly the highest regularly navigated body of water in the world, being at an elevation of some 14,000 ft. From the foot of the lake to the head of regular rail transportation the ore is handled by motor truck. Plans have been laid and the work begun for handling this material on another narrow-gage line. This road will be about 15 miles long. This is a fine example of what some of our American companies are doing to bring trade to this country and to give the United States supremacy in the use of alloy steels.

New Devices Among the Exhibits

Improvements in Farlow Draft Attachments

THE FARLOW ATTACHMENTS for connecting spring or friction draft gears to the car underframe, made by the T. H. Symington Company, New York, have been manufactured and sold for the past 18 years, the design having been improved from time to time to meet the requirements of increasingly heavier service. The original attachments were of the three-key type with separate side links. From this was developed the present form, having two draft keys and a horizontal forged yoke.

The present standard attachments, which meet all the A. R. A. requirements for strength are regularly furnished with a standard gear pocket length of 24⅝ in. from the rear face of the follower block to the end of the horizontal draft yoke, thus accommodating any standard friction draft gear whose parts are contained within the pocket limits. The standard cheek plates provide for full A. R. A. travel of 2¾ in. so that any draft gear meeting



Latest Design of Farlow Attachments

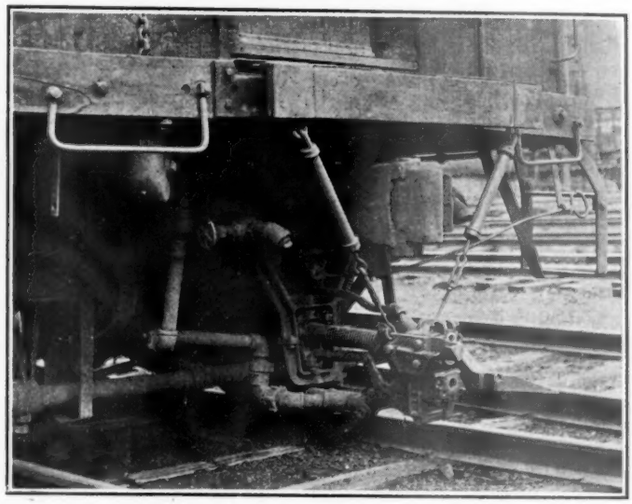
the A. R. A. specifications may be later substituted, if desired, for that first used.

Recent improvements in the Farlow details include the use of A. R. A. standard 6 in. by 1½ in. round edge horizontal keys, adequate reinforcement for strength and bearing area at the front end of the horizontal draft yoke, a box-section front follower block and a design of back-stop casting providing ample resistance to all possible service loads and distributing the latter to the underframe at the bolster over a sufficient sill area to prevent buckling or deformation of the draft sills or the loosening of rivets.

The follower block interposed between the coupler butt and the friction draft gear is designed to withstand the maximum load which the coupler shank is capable of delivering to it, this load often being far in excess of that required to close the draft gear. The malleable iron of which this block and cheek plates are manufactured is a high grade, uniform product whose minimum ultimate tensile strength and elongation are 50,000 lb. per square inch and 10 per cent respectively. Malleable iron specifications of a few years ago required only 38,000 lb. per square inch ultimate tensile strength and 5 per cent elongation, and a comparison between these figures and those now regularly attained by the manufacturers of high-grade malleable castings demonstrates the marked improvements which have recently been made in a material which from its structure and treatment is peculiarly adapted to resist shocks without crystalization and which when overstressed gives ample warning by its slow deformation before fracture.

Improvements in Futrell Train Line Connector

THE AUTOMATIC TRAIN LINE connector which is being shown at the convention by the Futrell Coupler Company, Streeter, Ill., embodies several improvements that have been made since a description was given in the *Railway Age* of March 4, 1921. The gathering arms have been changed to increase their gathering capacity and to insure their coupling on the sharpest of yard curves. The connector body has been cored out to give an air opening between the lower portion containing the steam heat connection and the air ports. This keeps the air port gasket cool and prevents vulcanization even

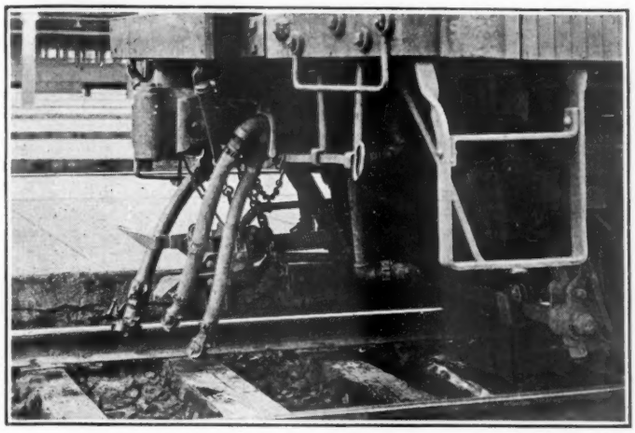


Connector in Position for Coupling.

when high pressure steam is used in the steam heating line. The steam heat gaskets have been changed to the standard type in common use where ordinary hose couplings are used.

Another important change has been made which will be of considerable advantage during a transition stage when cars equipped with the connector may be called upon to couple with other cars not so equipped. It consists in the method used for determining the position in which the coupler hangs. With this connector, the ordinary hose connections are not disturbed, but are left intact for use at any time, although where the connector is in regular use it is customary to remove the hose and their couplers. In the latest design of connector the bracket connected to the center sill, which acts as the spring seat

and from which the yoke holding the connector is hung, is provided with two pin holes. With the pin in the forward hole the connector will hang free in the position for coupling. By taking the pin out, pushing the head back and slipping the pin into a second hole, the connector is held 9 in. farther back than is ordinarily the case. In this position there is ample clearance between the connector and the regular hose, and consequently all chances of their being chafed and damaged are removed. It is only a few minutes' work to again shift the pin and restore the connector to its forward position when it is to be used.



Connector Swung Back for Interchange.

Sessions-Standard Friction Draft Gears

TWO NEW MODELS of friction draft gears, known as types KD and Jumbo No. 2 are prominent features of the exhibit of the Standard Coupler Company, New York.

The type KD is designed to meet the ever-increasing demands of greater draft gear strength and efficiency so vital to a car or locomotive in train operation. The travel, closing capacity, dimensions and application with all standard attachments are the same as for the improved type K; the weight, however, is greater.

The friction elements and springs are the same as those in the older type, except that the spring barrel is not interchangeable. The strength of this gear, (Figs. 1 and 2) when solid is 35 per cent greater as a column than the standard type D coupler. The great cross-sectional area of the spring barrel, 30 per cent more than type K, is made possible without encroaching on the spring space by its unique shape. The corrugations afford excellent guides for the springs and give the barrel a maximum strength as a column. The design of the spring barrel is such as to prevent any tendency to upset it in spots, but a still greater advantage is the large amount of support near the ends of the friction box keeping the friction surfaces from spreading and at the proper angle. The corrugations are so arranged that the friction box retaining lugs, made to fit them, will also encircle the cylindrical barrel used on the type K, making still greater interchangeability possible.

The Jumbo No. 2 gear, shown in Figs. 3, 4, is an exceptionally strong and high-capacity gear suitable for 70, 100 and 120-ton cars when fitted with standard heavy springs; it is ideal for lighter freight and all-passenger cars when equipped with lighter springs. It has a travel of 2¾ in., all of which is friction travel, and in addition is shipped and installed under ¼-in. friction compression that prevents any accumulation of slack for a long period of service, thereby maintaining its original high capacity. The gear is built and assembled under a high initial spring compression that makes it very effective in the early part of the stroke and at the same time eliminates chafing and wear of the friction elements for minor impacts where the resiliency of the car construction is ample to absorb such impacts without damage or frictional movement of any part of the gear or car relative to any other part. This gear, self-contained, is shipped and applied as a

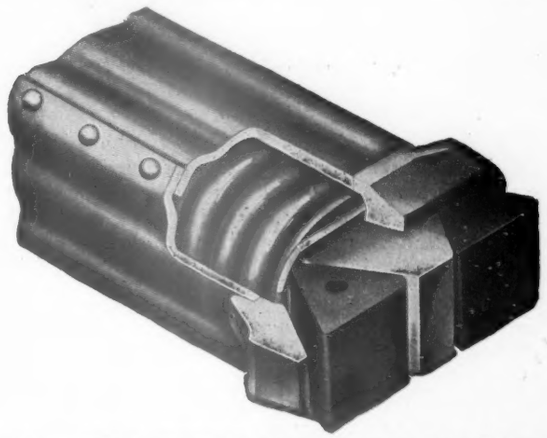


Fig. 1—The Type K D Gear Has a Stronger Barrel than the Old Type K

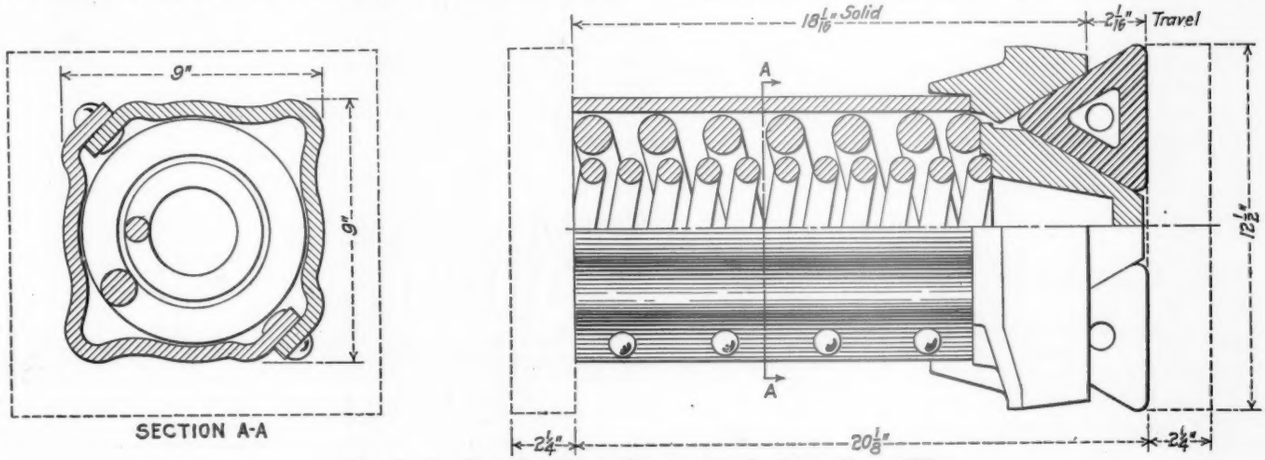


Fig. 2—Sessions-Standard Friction Draft Gear, Type KD

unit to cars with any type of attachments providing a standard draft gear pocket. No additional followers or yoke fillers are required, the barrel corners being rounded to accommodate the bend in forged yokes.

The gear is smooth in its action which makes it suitable for passenger equipment while the capacity may be lowered at will by the use of lighter springs, the over-solid strength remains high, higher in fact than any gear tested under the draft gear test of the U. S. R. A. and about 45 per cent stronger than the type D coupler. The drop capacity with a standard springs is 33 in. total fall under the 9,000 lb. drop, also exceeding anything in the

Fig. 3—Jumbo No. 2 Gear for Passenger and High Capacity Freight Cars

U. S. R. A. test. It differs from the Jumbo gear in that test in the following respects: travel reduced to 2¾ in., made self-contained, improved design of spring barrel with re-inforced bottom, spring barrel made of cast-steel instead of malleable iron, elimination of spring plate and key, forged steel instead of cast-iron center friction block, all friction travel, high initial spring and friction compression, round barrel corners.

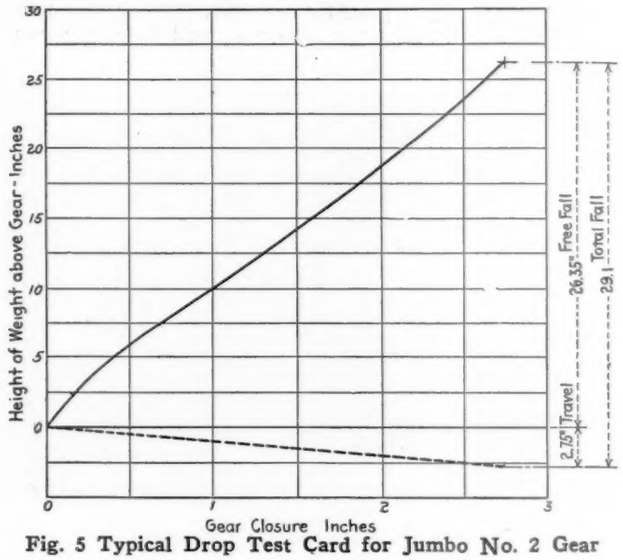


Fig. 5 Typical Drop Test Card for Jumbo No. 2 Gear

There are five double-coil springs arranged to take advantage of all available spring space and so located as to allow numerous re-inforcing webs or ribs immediately opposite the coupler butt thus preventing any possibility of piercing the bottom of the spring barrel. These ribs in part extend the length of the barrel, giving ample strength to the side walls. The per car weight of the gear, including followers, is 860 lb.

Four Jumbo No. 2 gears were submitted to capacity tests under 9,000-lb. drop. The average total fall required to close the gears was 29.1 in., or 21,825 ft. lb., as com-

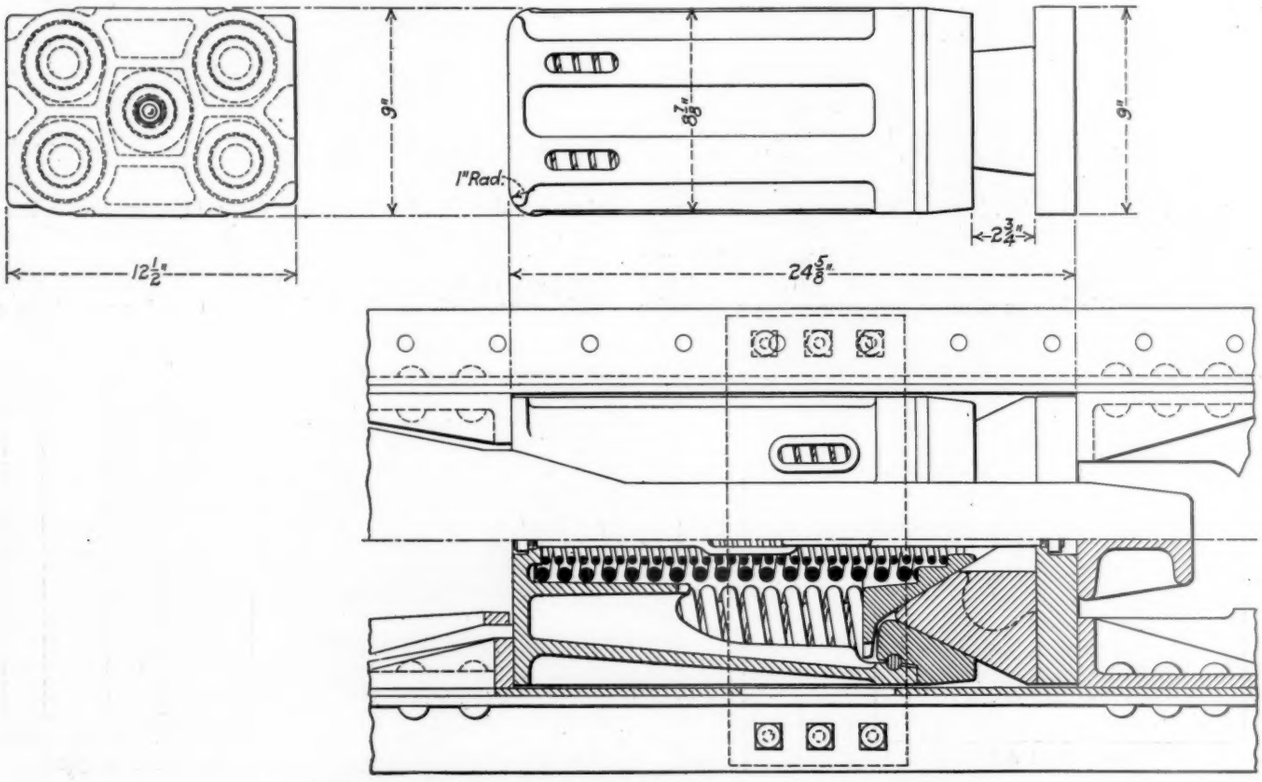


Fig. 4—Sessions-Standard Friction Draft Gear, Jumbo No. 2

pared to 28.1 in. for the older Jumbo gear in the U. S. R. A. tests. The average drop test card is shown in Fig. 5.

Two of the gears were subjected to car impact tests at the plant of the T. H. Symington Company, Rochester, N. Y. Although the tests were made in January during a light rain and snow, the gears required a closing speed of 4.83 m. p. h. on the 148,000-lb. test car as against 4.22 m. p. h. for the older Jumbo gear in the U. S. R. A. tests.

Two of the gears were subjected to destruction tests under the 9,000 lb. drop when supported upon a solid anvil. It required an average over-solid blow of 18-in. to produce noticeable distress in any part. Bulging was finally produced in the cast-steel barrel but after carrying the total free fall to 50 in. they were still in condition for service.

Service Metal Gage for Steel Wheels

AMONG THIS YEAR'S exhibits is a new device shown by Bernard Cook, Roanoke, Va., for gaging the amount of metal to be removed from worn-flange wheels to restore the standard contour and to indicate in advance of turning the final tape of the wheel so that remating may be done without loss. The A. R. A. interchange rules allow $1.61 for each 1/16 in. of service metal on a 33-in. wheel; hence no neglect should be countenanced in the handling of wrought steel wheels.

This gage, which is known as the I-D service metal wheel gage, gives accurate information in advance of re-turning, not only of the final tape of the wheel and of the amount of metal that will be removed, but it also indicates the amount of service metal that will remain on the wheel. This latter provision frequently foretells that the wheel will fall within the scrapping limits after it has been re-turned and saves not only the labor of re-turning, but protects the handling road from allowing false credits to the owning road for wheels that should have been given scrap credits only.

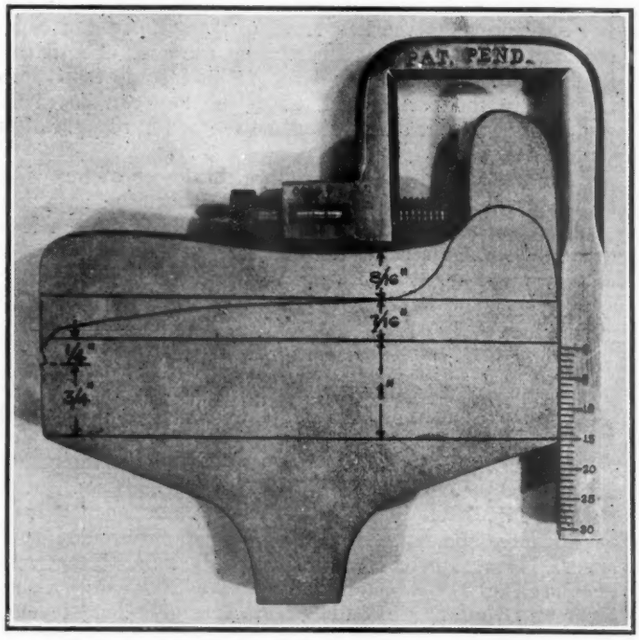


Fig. 1

The use of the gage is illustrated in Fig. 1. The micrometer screw indicates that 5/16 in. of metal must be removed to restore the standard contour. The graduated scale on the long leg of the gage shows that before re-turning there are 15/16 in. of metal available above the condemning limit, so that after turning there will be 7/16 in. of service metal remaining. Such a wheel would accordingly be allowed a credit of 7/16 in. of service metal, amounting to $11.27.

The gage is of equal value in handling car wheels and driving wheel tires in shops where they are turned. By its use wheels can be selected and mated before turning with a minimum loss of service metal. A remating table accompanies the gage to show the tape of the wheel after turning.

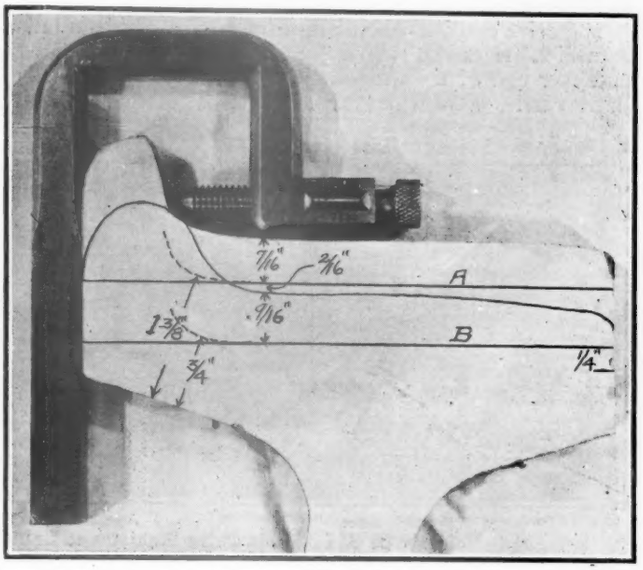


Fig. 2

Fig. 2 illustrates how the I-D gage prevents false credit being allowed for a wheel that should have been given scrap credit only. A. R. A. Rule 7, Fig. 4, allows a wheel to be turned down to within 1/4 in. of the limit groove as indicated by line *B*, but also sets a limit of 1 3/8 in. above the "critical" line, this limit being indicated by line *A*. If the wheel in the illustration were settled for on the basis of the limit groove, the owning road would be given credit for 9/16 in. of service metal remaining after turning the wheel to restore standard contour, or a credit of $14.49 would be allowed for this wheel, plus an equal amount allowed under the rule for the mate wheel, or a total of $28.98 for service metal in this case. The gage shows, however, that the wheel, in fact, will be 5/8 in. under the minimum allowance from the critical line, so that no credit whatsoever should have been allowed for service metal in the above case.

The illustration is of a wheel actually detected by this gage and for which scrap value only was allowed, under Rule 7, Fig. 4, of the A. R. A. code.

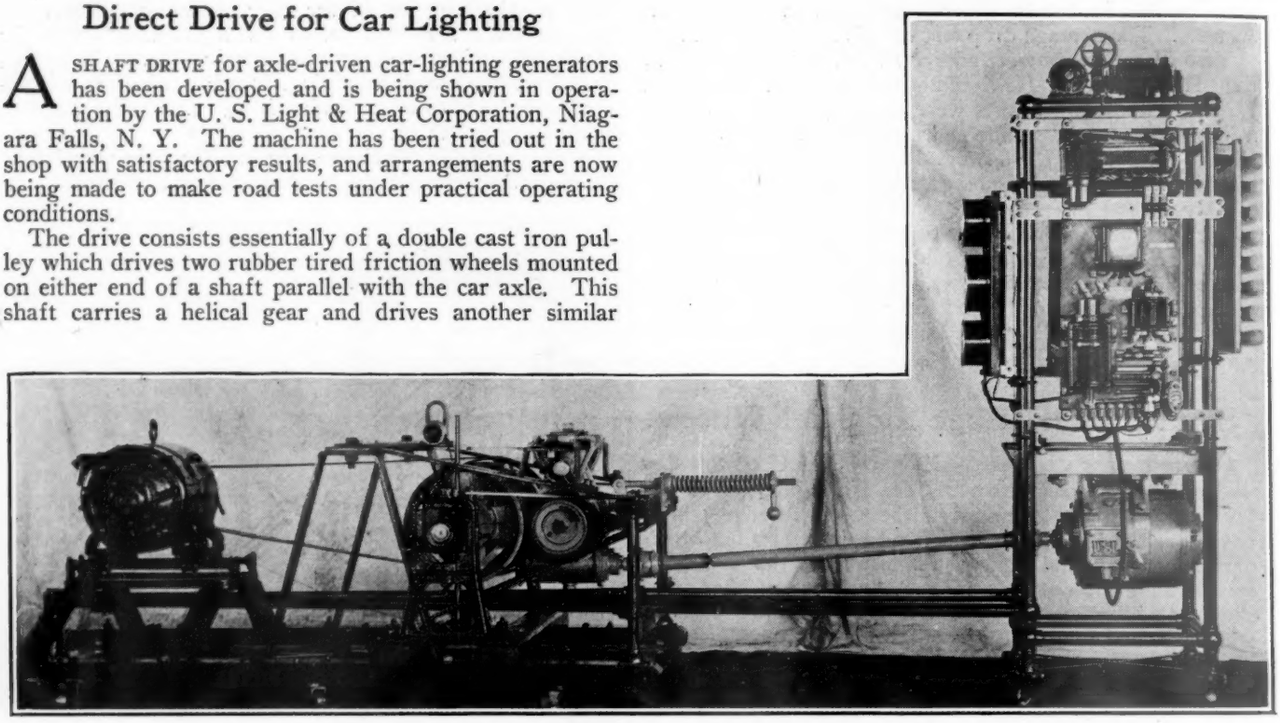
Pressure Filter for Dining Cars

A NEW PRESSURE filter for use in dining cars has been designed by the Henry Giesel Company, Chicago. The cover is opened and closed with a locking bolt operated by a handle in front. No clamps or bolts are used and as the bolt is attached to the handle it cannot be mislaid. After the cover has been taken off the filter stone may be easily removed by a wrench furnished with the filter.

Direct Drive for Car Lighting

A SHAFT DRIVE for axle-driven car-lighting generators has been developed and is being shown in operation by the U. S. Light & Heat Corporation, Niagara Falls, N. Y. The machine has been tried out in the shop with satisfactory results, and arrangements are now being made to make road tests under practical operating conditions.

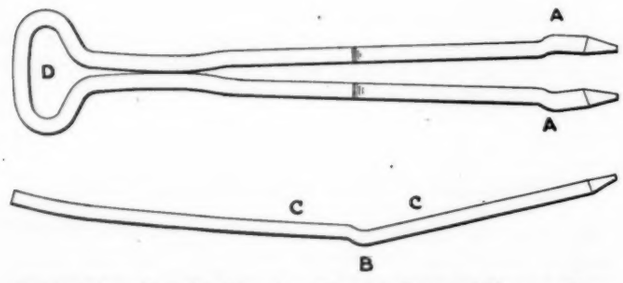
The drive consists essentially of a double cast iron pulley which drives two rubber tired friction wheels mounted on either end of a shaft parallel with the car axle. This shaft carries a helical gear and drives another similar gear at twice the speed and the axis of which is at right angles to the first gear. These gears run in oil. The shaft of the second gear is connected to the generator on the body of the car by a telescoping shaft and two universal joints, similar to the arrangement used for automobile shaft drives.



The U. S. L. Shaft Drive Equipment Complete With Motor-Drive and Lamp Bank Load

Self-Locking Brake Shoe Key

THE NUMBER OF brake shoe keys which are lost from freight cars, particularly on those roads where cars are unloaded by dumping machines, is an item of considerable expense. To save this loss an improved type of key has been brought out by E. Emery, Pittsburgh, Pa. The key is of a rectangular section, the steel containing sufficient carbon to insure the proper spring and give good wearing qualities. The shoulders, *AA*, shown in the illustration, open out below the lower lug of the brake head and prevent any upward movement of the key. The offset at *B* allows for the maximum and minimum slot between brake head and shoe provided for by the A. R. A. standards and pulls the shoe up tightly against the head. This gives a double bearing to the key on the head at *CC*, and a bearing against the shoe lug at *B*. The head of the key not only prevents the key from working down but is so shaped that by inserting a bar under the head at *D* it can be pried up until the shoulders, *AA*, are compressed into the slot in the brake head, when the key can be easily pulled out without damage and be ready for reapplication with a new shoe.



Brake Shoe Key Designed to Prevent Loss of Key or Shoe

This key should not only reduce the losses of keys but also prevent the loss of brake shoes with the resulting further expense due to injury to brake beams, even if a derailment and wreck do not occur.

Automatic Slack Adjuster

A NEW DEVELOPMENT of its automatic brake slack adjuster which is especially adapted to freight and locomotive service is shown by the Gould Coupler Company, New York. It takes the place of the usual bottom rod connection and will maintain a uniform piston travel until the shoes are entirely worn out when it may be instantly shortened to permit the application of new shoes. This adjuster consists primarily of a bottom rod composed of two wrought steel bars with spacing pieces between to admit the ends of the live and dead levers. The live lever end of the rod is provided with a series of ratchet teeth which engage a pair of steel dogs attached to the brake lever. The function of the heavier of these two dogs is to transmit the brake pressure through the bottom rod to the brake shoes and of the smaller automatically to lengthen out the bottom rod as wear occurs in the shoes.

The only change required in the foundation brake rigging to apply this adjuster is the drilling of one hole in the lower part of the lever. Laboratory and service tests are reported to have been quite satisfactory.

Double Automatic Control Vapor System for Passenger Cars

THE VAPOR CAR HEATING COMPANY, Inc., Chicago, has recently marketed a double automatic control vapor system, the purpose of which is to change from a constant temperature of 70 deg. while the car is in service to 50 deg. in yards and terminals without manually operating the cut-out valves.

On the average, passenger cars lay over in yards or terminals two-thirds of the time, and during such lay-over periods are excessively heated as the result of leaving all the heat turned on to prevent freezing of water pipes and to permit of washing and cleaning the cars. By automatically regulating the temperature to 50 deg. in cars laying over in the yards steam is used in the heating pipes less than one-fourth of the time. This means a large saving in coal consumption, conservatively estimated on the basis of actual tests to average from 15 to 20 tons per car per season.

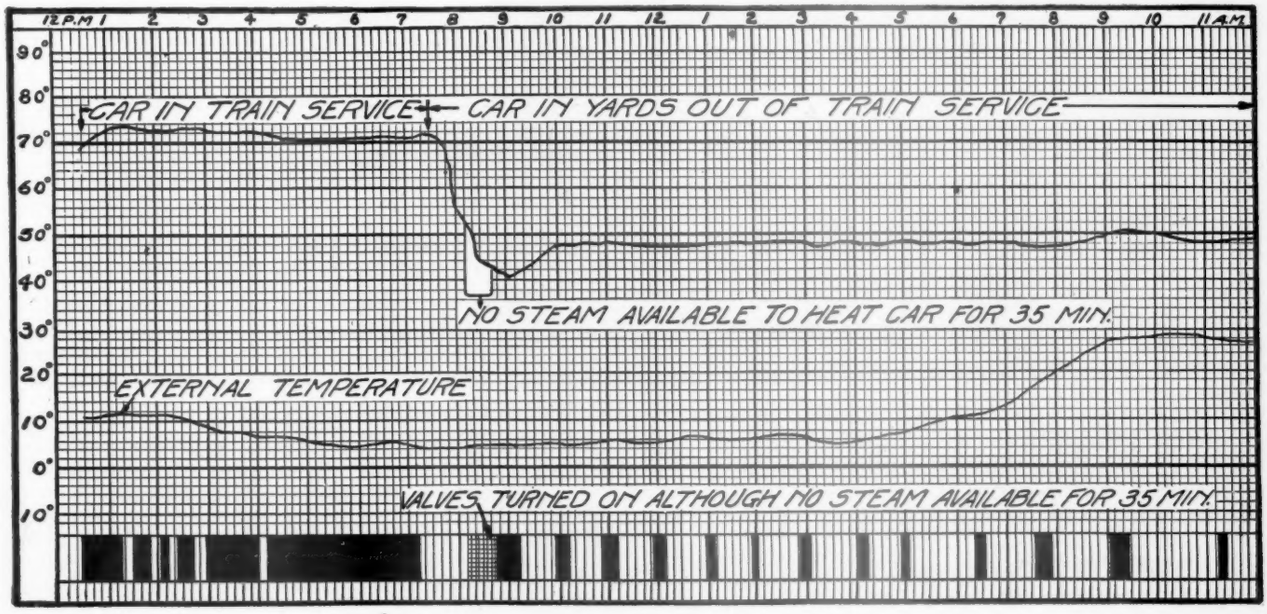
Electro-Pneumatically Operated Control Valve

The new arrangement may readily be applied to cars already equipped with the "Vapor" system, as the only change involved is the substitution of the automatically operated cut-out valves in place of the present hand-operated valves. In the case of an ordinary coach, chair or dining car, instead of the two hand-operated Vapor cut-out valves now used, one magnetically operated control valve is used on each side of car. This valve operates on the same short-circuit self-drawing principle as the manually operated Vapor cut-out valve, and therefore serves constantly to keep the outlet of the system warm at all times, positively preventing freezing of the system.

In addition to the magnetically operated control or cut-out valves, there is one double thermostat located at the center of the car near the basket rack. One of the elements of this thermostat is set for a permanent temperature of 70 deg. and the other for 50 deg. The thermostats never require adjustment or change. At the end of the car, near the electric light switchboard, is a control cabinet, which contains a combination air-pressure and electric device which automatically selects either the 70 deg. or the 50 deg. thermostat. When the car is attached to a locomotive for passenger service, the pressure from the air line operates this device, putting the 70 deg. thermostat in control and maintaining a temperature between 70 and 72 deg. at all times when steam is being suplied from the locomotive. When the car is removed from service and goes into the yards, the pressure on the air line is released and the combination air pressure and electric device then puts the 50 deg. thermostat in control.

This arangement of the control system removes the necessity for train crews or yard men to operate the steam admission valves by hand at any time.

In cases where cars are placed under steam while occupied by passengers, in stations, or at lay-over points, while waiting for the locomotive to be attached, a 70 deg. temperature control may be obtained by lifting a button provided on top of the combination air and electric device in the control cabinet. After pulling up the button for this purpose, no further attention is necessary, as the system again becomes automatic as soon as air is applied. There is a snap switch in the control cabinet to be used only to cut off current in the summer months or for repairs. In case the electric current fails the magnetic

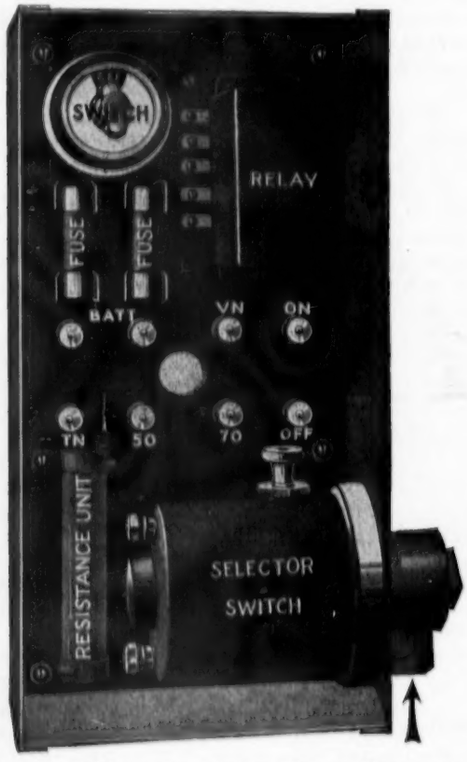

12 P.M. 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 A.M.
90°
80°
70°
60°
50°
40°
30°
20°
10°
0°
10°
CAR IN TRAIN SERVICE
CAR IN YARDS OUT OF TRAIN SERVICE
NO STEAM AVAILABLE TO HEAT CAR FOR 35 MIN.
EXTERNAL TEMPERATURE
VALVES TURNED ON ALTHOUGH NO STEAM AVAILABLE FOR 35 MIN.

Black bars show the time steam was actually turned on.

Diagram Showing Results of Test of the Automatic Control Equipment

valves may be operated by hand the same as any Vapor cut-out valve.

The system is operated by electric current from the car lighting batteries and requires less than 0.1 ampere per hour, but the electrical mechanism of the cut-out valve



Control Cabinet Containing Electro-Pneumatic Selector Apparatus

is such that the current is automatically cut off from the magnets with the completion of the act of moving the valve from one position to the other. The electrical equipment is simple and of standard materials, and the entire system is constructed with the view of operating indefinitely at the minimum expense for maintenance.

Pneumatic Tools

TWO NEW DEVELOPMENTS in pneumatic tools made by the King Pneumatic Tool Company, Chicago, are a sleeve-type valve for riveting hammers and a "Progressive" lock for both chipping and riveting hammers which prevents the handles from coming loose on the cylinders.

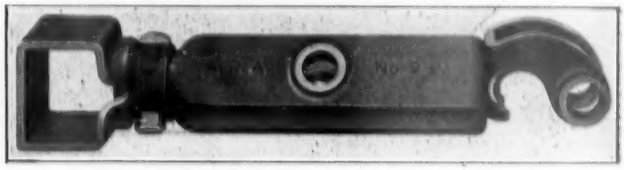
The King sleeve valve for riveting hammers is designed to eliminate valve breakage and reduce the necessity of oversizing valves to a minimum. In the King riveting hammer valve the hard and fast hitting qualities of the hollow-valve type riveting hammer are maintained and the question of valve breakage is claimed to be solved. Formerly a riveting hammer piston in hollow-valve type hammers came in direct contact with the valve; the piston and the valve moved in opposite directions and the piston came in direct contact with the valve 1,050 to 1,720 times per minute, according to the length of stroke of the hammer. This constant contact between piston and valve resulted in fatigue of the metal in the valve itself, with resulting valve breakage.

In the King sleeve-type valve the sleeve is interposed between the valve and the piston, making any contact between the two impossible. At the same time the sleeve provides a continuous bearing surface for the piston. An added advantage of the sleeve-type valve is that the sleeve serves as a guide to the valve in its travel, thus reducing the lateral wear to a minimum. This new device has been so successful in eliminating valve breakage that last year, out of 5,000 King sleeve valves placed in service, only 15 cases of breakage were reported.

King pneumatic tools are now made entirely of molybdenum steel, which has added to their strength and durability.

Forged Reversible Brake Beam Strut and Safety Brake Shoe Key

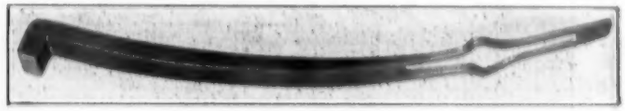
THE FORGED REVERSIBLE brake beam strut made by the Buffalo Brake Beam Company, New York, and shown in the illustration, was designed especially for quick repair work. It may be applied to any style of beam and, being made of forged steel, ample strength, durability, economy and safety are insured. A special feature of the



Buffalo Forged Reversible Brake Beam Strut

strut is the fact that it may be reversed so as to make either a right-hand or a left-hand beam without disturbing the nuts or tension on the beam.

The Buffalo safety brake shoe key is made to A. R. A. standards in all essential dimensions. Although it may be applied and removed practically as easily as an ordinary key, it cannot work out in service or when cars are being dumped on a machine. The principle of the key is apparent from the illustration. That portion which extends below the lug on the brake head is punched out and ex-



Buffalo Safety Brake Shoe Key

panded. The key is made of spring steel and when it is inserted the expanded lugs or ears close in and automatically open out when the key is in place, thus making a positive lock to prevent its coming out unless intentionally removed.

Weather Stripping

AMONG A NUMBER of new devices shown by Midgley & Borrowdale, Chicago, is included the Protecto metal-bound felt weather stripping for passenger car windows. This is made of all-wool, hand-pressed weather felt, cut to length as specified. This weather stripping has been adopted as a standard by the Canadian Northern.